

# Project Manual

## Bid Documents

### **Jefferson County Courthouse and Sheriff's Building Renovations and Additions Jefferson, Wisconsin**

2020.01.00

July 22, 2022

Volume 1 of 2







<b>PROJECT:</b>	JEFFERSON COUNTY COURTHOUSE AND SHERIFF'S BUILDING RENOVATION AND ADDITIONS
<b>OWNER:</b>	JEFFERSON COUNTY 311 SOUTH CENTER AVENUE JEFFERSON, WISCONSIN 53549
<b>ARCHITECT:</b>	POTTER LAWSON, INC. 749 UNIVERSITY ROW, SUITE 300 MADISON, WISCONSIN 53705
<b>CONSTRUCTION MANAGER:</b>	MAAS BROTHERS CONSTRUCTION 410 WATER TOWER COURT WATERTOWN, WISCONSIN 53094 PHONE (920) 261-1682
<b>CONSULTANTS:</b>	
PROFESSIONAL ENGINEERS:	
Civil/Landscape	POINT OF BEGINNING 4941 KIRSCHLING COURT STEVENS POINT, WISCONSIN 54481
Structural	IMEG CORPORATION 1800 DEMING WAY, SUITE 200 MIDDLETON, WISCONSIN 53562
Mechanical/Electrical/Plumbing	DESIGN ENGINEERS 437 SOUTH YELLOWSTONE DRIVE, SUITE 110 MADISON, WISCONSIN 53719 PHONE (608) 424-8815

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# **PROCUREMENT REQUIREMENTS**



## BID CATEGORY #01 – SITE WORK & SITE UTILITIES

### 1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

#### **DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

#### **DIVISION 01 - GENERAL REQUIREMENTS**

31 10 00 Site Clearing  
31 20 00 Earth Moving  
31 23 00 Foundation Excavating and Backfilling  
31 25 00 Erosion Control  
32 11 23 Aggregate Base Courses  
32 13 13 Concrete Paving  
32 17 23 Pavement Markings  
33 31 00 Sanitary Sewer Systems  
33 41 00 Storm Utility Drainage Piping  
Asphalt Patching  
Underpinning (As applicable to this bid category)

### 2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).

- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

### 3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above
- b. Excavation, backfill and compaction required to complete work of this Bid Category
- c. Coordination with local utilities
- d. Permits and fees for this work
- e. Provide and remove temporary gravel access drive
- f. Haul and dispose of all excess materials offsite
- g. Associated layout/surveying for this work (Maas Brothers will provide only site boundaries, building corners, and a benchmark elevation)
- h. Removal of existing trees and shrubs, vegetation, paving, foundations, rubble to be disposed of off site
- i. Protection of adjacent work, and salvage of material for reuse as directed by the owner/architect
- j. Tree protection
- k. Street cleaning and traffic control measures for this work
- l. Removal of topsoil for reuse during final grading, store topsoil onsite and provide temporary erosion control and seeding as required
- m. Grade site to final subgrade elevations indicated on the plans
- n. Import or export of material as needed
- o. Placing, maintaining and removal of erosion control measures per plan. Maintenance to be performed throughout the duration of the project
- p. Removal of spoils related to the earth retention system/push piles at the west addition
- q. Conduct DNR Erosion Control site inspections and fill out all necessary reports as required. Supply copies of reports to Maas Brothers within 24 hours of a rain event
- r. Periodic removal of silt from basins as required during construction
- s. Footing/foundation excavation and backfill. Maintain grades around excavation to prevent surface water from entering excavations. Excavations to follow any and all OSHA Regulations.
- t. Crushed aggregate base course for asphalt paving, concrete paving, sidewalks, curbs, concrete site pads, and building slabs on grade to within one tenth of a foot (this contractor will also provide all crushed aggregate for fine grading)
- u. Sawcut & Removal of Asphalt as indicated
- v. Asphalt patching as identified on the plans (sawcut asphalt edge again prior to patching so a clean line is present)
- w. Removal/disposal of existing MIS Building at 402 S. Center Avenue including all local permits and fees for abandonment of all existing utilities (asbestos abatement by owner). Foundation removal and backfill with suitable compactable fill is required
- x. Topsoil placement and final grading ready for seeding and landscaping by others
- y. Hand work required to complete this work

- z. Provide and remove concrete wash out area for concrete trucks
- aa. All sanitary sewers, storm sewers (Including storm sewers related to downspouts), and associated structures
- bb. Site demolition as shown including saw cutting of asphalt/concrete and removal
- cc. Assist in the excavation for the indicated underpinning of existing foundations (machine work for removal of soils)
- dd. Pumping water from utility trenches
- ee. Concrete curb
- ff. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Concrete work
- b. Sidewalk, fencing, landscape repairs and restoration work

## BID CATEGORY #02 – LANDSCAPING

### 1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

#### **DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

#### **DIVISION 01 - GENERAL REQUIREMENTS**

32 91 19 Landscape Finish Grading

32 92 00 Turf and Grasses

32 93 00 Plants

### 2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this

Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.

- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above
- b. Excavation and backfill required to complete work of this Bid Category
- c. Fine grade/prep/screen/rake/pulverize existing topsoil to an acceptable consistency
- d. Associated layout/surveying for this work (Maas Brothers will provide only site boundaries, building corners, and a benchmark elevation)
- e. Landscaping plantings, mulch, and edging
- f. Seeding
- g. Removal, temporary storage, and reinstallation of existing pavers as indicated
- h. Street cleaning and traffic control measures for this work
- i. Maintenance as required by the specifications
- j. Repair/restoration of areas disturbed from the removal of erosion control devices
- k. Erosion Mat as indicated
- l. Restoration of grass and planting areas
- m. Performance and payment bond

4. EXCLUDED ITEMS:

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

03 10 00 Concrete Formwork  
03 20 00 Concrete Reinforcement  
03 30 00 Cast-In-Place Concrete  
03 35 46 Concrete Topical Treatments  
05 05 53 Security Metal Fastenings (As applicable to this bid category)  
07 11 13 Bituminous Dampproofing  
07 21 00 Thermal Insulation (As applicable to this bid category)  
07 92 00 Joint Sealants (As applicable to this bid category)  
32 13 13 Portland Cement Concrete Paving (As applicable to this bid category)  
32 13 75 Pavement Joint Sealants  
Underpinning (As applicable to this bid category)

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).



- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

### 3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above
- b. Associated layout/surveying for this work (Maas Brothers will provide only site boundaries, building corners, and a benchmark elevation)
- c. Street cleaning and traffic control for this work
- d. All interior and exterior concrete work
- e. Removal of water from foundation trenches as needed
- f. Assist in coordination and installation of plumbing pipe sleeves, electrical sleeves, utilities and any and all other impertinences either under, through or over related concrete work
- g. Furnish and installation of all reinforcing steel
- h. Furnish and installation of all rigid foundation insulation
- i. Furnish and installation of all bituminous dampproofing
- j. Furnish and installation of joint sealants as required for this scope of work
- k. Furnish and installation of concrete benches/bunks at the Law Enforcement Center
- l. Handwork associated with excavation for underpinning (BP#1 responsible for machine work to remove soils)
- m. Foundation underpinning where required
- n. Fine grading
- o. Installation of embedded items/anchor bolts
- p. Grouting of steel plates and/or columns
- q. Concrete equipment pads per Construction Documents
- r. If acceptable to owner, grinding of any slabs due to curling
- s. Floor prep that may be required due to excessive concrete slab curing due to substandard installation practices
- t. Caulking of concrete work per Construction Documents
- u. Prepare slabs for and furnish and install sealers per Construction Documents
- v. Concrete testing
- w. Wet curing
- x. Installation and cleaning of concrete filled steel bollards furnished by the steel supplier
- y. Concrete slab replacement as required for installation of new and abandoned underground plumbing
- z. Site concrete, aprons and equipment pads
- aa. Performance and payment bond

### 4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule

- b. Supplying anchor bolts
- c. Concrete Curb
- d. Micro piles/earth retention (design, engineering and installation) at area indicated on the west addition on the structural plans, including excavation and footing removal as required (hauling and removal/disposal of spoils by bid package #1)

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

04 20 00 Unit Masonry

04 72 00 Cast Stone Masonry

05 05 53 Security Metal Fastenings (As applicable to this bid category)

07 21 00 Thermal Insulation (As applicable to this bid category)

07 84 13 Penetration Firestopping (As applicable to this bid category)

07 84 43 Joint Firestopping (As applicable to this bid category)

07 92 00 Joint Sealants (As applicable to this bid category)

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.

- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above
- b. Associated layout
- c. Street cleaning and traffic control for this work
- d. Furnish and install all masonry including flashings, reinforcing, insulation and accessories as specified
- e. Furnish and install all precast sills, headers, and bands as indicated
- f. Hoisting for this work
- g. Removal of masonry debris from site on a daily basis
- h. Safety barricades for this work
- i. Include grouting of metal frames
- j. Include setting steel embeds in masonry
- k. Install steel lintels and embeds provided by Bid Category #05
- l. Include patching of existing walls to match adjacent walls
- m. Furnish and install all reinforcing steel in CMU walls
- n. Furnish and install openings for MEP trades as required in new construction
- o. Caulking associated with masonry
- p. Masons to supply their own water for construction activities
- q. Include masonry patching for all new openings in existing walls to include setting lintels and toothing (needling and demolition will be by BP #07)
- r. Supply/install mineral wool insulation behind masonry
- s. Salvage and relocate date stones as identified
- t. Infill stone at miscellaneous areas using salvaged materials (removal of materials to be reused is by the mason)
- u. Include bentonite grout full height between shotcrete and masonry wall at corridor C0040
- v. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Supplying steel lintels
- b. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

05 12 23 Structural Steel

05 31 00 Steel Deck

05 50 00 Metal Fabrications

05 51 13 Metal Pan Stairs

05 51 19 Metal Grating Stairs

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- b. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- c. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- d. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- e. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- f. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- g. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- h. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- i. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- j. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- k. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- l. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- m. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- n. Provide a project specific Safety Program to Construction Manager.
- o. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore,

Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.

- p. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- q. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Furnish all structural and misc. steel per Construction Documents
- f. Furnish only anchor bolts
- g. Any engineering work required by the specification
- h. Furnish exterior bollards as indicated including bollards shown on the site plan
- i. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- j. Coordinate with other trades as necessary
- k. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.
- b. Installation of the BP#05 Steel Materials

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

05 05 53 Security Metal Fastenings (As applicable to this bid category)

05 12 00 Structural Steel Framing

05 31 00 Steel Deck

05 50 00 Metal Fabrications

05 51 13 Metal Pan Stairs

05 51 19 Metal Grating Stairs

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.

- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Anchor bolt survey prior to commencing with steel erection. Discrepancies are to be immediately reported to Construction Manager. Survey is to be completed at completion of concrete work
- f. Installation of the BP#05 Steel Materials
- g. Install all structural and misc. steel per Construction Documents
- h. Any engineering/testing work required by the specification
- i. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- j. Touch up painting as required due to damage or field welding
- k. Coordinate with other trades as necessary
- l. One-year warranty
- m. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.
- b. Installation of concrete filled bollards
- c. Installation of steel masonry lintels



## BID CATEGORY #07 – GENERAL CONSTRUCTION

### 1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

#### **DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

#### **DIVISION 01 - GENERAL REQUIREMENTS**

02 41 19 Selective Demolition  
05 05 53 Security Metal Fastenings (As applicable to this bid category)  
05 73 00 Decorative Metal Railings  
06 10 00 Rough Carpentry  
06 16 00 Sheathing  
06 20 23 Interior Finish Carpentry  
06 40 00 Architectural Woodwork  
06 42 16 Flush Wood Paneling  
07 24 19 Water-Drainage Exterior Insulation and Finish System  
07 81 00 Applied Fireproofing  
07 81 23 Intumescent Fireproofing  
07 84 13 Penetration Firestopping (As applicable to this bid category)  
07 84 43 Joint Firestopping (As applicable to this bid category)  
07 92 00 Joint Sealants (As applicable to this bid category)  
08 11 13 Hollow Metal Doors and Frames  
08 12 16 Aluminum Frames  
08 14 16 Flush Wood Doors  
08 63 00 Metal-Framed Skylights  
08 71 00 Door Hardware (As applicable to this bid category)  
09 67 23 Resinous Flooring  
10 00 10 Miscellaneous Specialties  
10 11 00 Visual Display Surfaces  
10 14 00 Signage  
10 21 13.13 Metal Toilet Compartments  
10 22 13 Wire Mesh Partitions  
10 22 39 Folding Panel Partitions  
10 28 00 Toilet, Bath, and Laundry Accessories  
10 51 13 Metal Lockers  
10 51 29 Phenolic Lockers  
12 67 23 Benches  
14 42 00 Wheelchair Lifts  
Micro Piles (Earth Retention System)

### 2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required

to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).

- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

### 3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Provide project manager and qualified **full time onsite supervisor** (changes to personnel will require CM approval)
- f. Include micro piles/earth retention at area indicated on west addition (design, engineering and installation) on the structural plans, including excavation and footing removal as required (hauling and removal/disposal of spoils by bid package #1)
- g. Demolition of new openings in existing masonry to include any required shoring/needling. Demo in a workmanlike manner to accommodate toothing by masonry contractor
- h. Remove and salvage existing wire mesh partitions as noted on the demolition plan
- i. Remove and reinstall existing fire extinguisher cabinets and provide new as indicated on plan
- j. Removal and reinstallation of existing booking casework as noted at the Jail

- k. Removal and reinstallation of existing courtroom gallery seating including modifications to existing (refinishing by BP 13)
- l. Removal and reinstallation of existing jury chairs including new jury chairs identified
- m. Remove/modify/reinstall existing shelves as indicated at the Judges Chambers
- n. New courtroom gallery seating as shown on the plan
- o. Furnish and Install all rough carpentry and wood blocking required
- p. Metal supports for countertops
- q. Removal, relocation and reinstallation of existing granite panels as noted
- r. Any engineering work required by the specification
- s. Safety barricades for this work
- t. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- u. Coordinate with other trades as necessary
- v. Provide all security sealants as required including those required by the MEP trades
- w. Furnish and install all hollow metal doors and frames, wood doors, and door hardware. Coordination of shop drawings/approvals, field measuring, receiving materials on-site, verification of correct material deliveries, coordination of any returns, storage onsite for installation and installation warranty
- x. Furnish and install all caulking needed for this bid category
- y. Furnish and install firestopping/caulking at rated wall and ceiling junctures. Firestopping/caulking of penetrations installed after wall or ceiling installation will be by the trade making the penetration
- z. Furnish and install door hardware/wood doors that are installed in aluminum frames (coordinate with AL contractor)
- aa. All selective demolition work other than mechanical, electrical and plumbing
- bb. Remove and salvage existing high density file storage as noted
- cc. Remove and salvage existing court reporter stations
- dd. Remove and reinstall court reporter wall tablets
- ee. Include \$35,000 allowance for EIFS work
- ff. Demolition of existing terrazzo cove base at new openings in main corridors in a workmanlike manner
- gg. Supply all dumpsters for demolition including dumpsters for fire protection, plumbing, HVAC and electrical
- hh. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.
- b. Detention Doors and hardware

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

05 05 53 Security Metal Fastenings (As applicable to this bid category)  
07 21 00 Thermal Insulation (As applicable to this bid category)  
07 42 13.13 Formed Metal Wall Panels  
07 46 16.13 Extruded Aluminum Siding  
07 53 23 Ethylene-Propylene-Diene-Monomer (EPDM) Roofing  
07 62 00 Sheet Metal Flashing and Trim  
07 65 00 Flexible Flashing  
07 71 29 Manufactured Roof Expansion Joints  
07 72 73 Vegetated Roof Systems  
07 76 00 Roof Pavers  
07 92 00 Joint Sealants (As applicable to this bid category)  
07 95 13.16 Exterior Expansion Joint Cover Assemblies

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.

- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. All requirements of Specification Sections as noted in Scope of Work above.
- c. Safety barricades for this work
- d. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- e. Street cleaning and traffic control measures for this work
- f. Building insulation (associated with roofing)
  - a. Supply/install mineral wool insulation behind metal siding/wall panel
  - b. Any engineering work required by the specification
  - c. Safety barricades for this work
  - d. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
  - e. Provide all sub framing as indicated for attachment of metal siding/wall panel
  - f. Coordinate with other trades as necessary
  - g. Flash all openings required by mechanical trades
  - h. Furnish and install all caulking needed for this bid category
  - i. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

05 05 53 Security Metal Fastenings (As applicable to this bid category)  
07 21 00 Thermal Insulation (As applicable to this bid category)  
07 92 00 Joint Sealants (As applicable to this bid category)  
08 41 13 Aluminum-Framed Entrances and Storefronts  
08 44 13 Glazed Aluminum Curtain Walls  
08 41 23.13 Fire-Rated Window Assemblies  
08 44 33 Sloped Glazing Assemblies  
08 56 59 Service and Teller Window Units  
08 71 00 Door Hardware (As applicable to this bid category)  
08 80 00 Glazing

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.

- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Any engineering work required by the specification
- f. Safety barricades for this work
- g. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- h. Supply and install glazing associated with all hollow metal borrowed lites and doors
- i. Supply and install mirrors
- j. Supply and install all flashings, claddings and trims as part of the entrances, storefronts and new windows
- k. Supply and install all hardware associated with this bid category
- l. Supply and install all automatic door openers associated with this bid category
- m. Coordinate with General Trades where wood doors and hardware are installed in aluminum frames
- n. Coordinate with other trades as necessary
- o. Furnish and install all caulking needed for this bid category
- p. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

05 05 53 Security Metal Fastenings (As applicable to this bid category)

05 40 00 Cold-Formed Steel Framing

07 21 00 Thermal Insulation (As applicable to this bid category)

07 21 19 Foamed-In-Place Insulation

07 27 26 Fluid Applied Membrane Air Barriers

07 84 13 Penetration Firestopping (As applicable to this bid category)

07 84 43 Joint Firestopping (As applicable to this bid category)

07 92 00 Joint Sealants (As applicable to this bid category)

07 95 13.13 Interior Expansion Joint Cover Assemblies (As applicable to this bid category)

09 21 16.23 Gypsum Board Shaft Wall Assemblies

09 22 16 Non-Structural Metal Framing

09 24 00 Portland Cement Plastering

09 29 00 Gypsum Board

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.



- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Layout as it pertains to this work
- d. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- e. Supply and install insulation within stud cavities
- f. Street cleaning and traffic control measures for this work
- g. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- h. Building insulation
- i. Supply and installation of fire caulking as required for this scope of work
- j. Any engineering work required by the specification
- k. Safety barricades for this work
- l. Supply and install all drywall to drywall expansion joints
- m. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- n. Coordinate with other trades as necessary
- o. Furnish and install all cold formed metal framing including design drawings stamped by Engineer registered in the State of Wisconsin
- p. Furnish and install firestopping/caulking at rated wall and ceiling junctures. Firestopping/caulking of penetrations installed after wall or ceiling installation will be by the trade making the penetration
- q. Include \$75,000 allowance for detention plaster patching not identified on the plan
- r. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

05 05 53 Security Metal Fastenings (As applicable to this bid category)

07 92 00 Joint Sealants (As applicable to this bid category)

07 95 13.13 Interior Expansion Joint Cover Assemblies (As applicable to this bid category)

09 30 13 Ceramic Tiling

09 65 13 Resilient Base and Accessories

09 65 16 Resilient Sheet Flooring

09 65 19 Resilient Tile Flooring

09 66 13 Portland Cement Terrazzo Flooring

09 68 13 Tile Carpeting

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.

- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- f. Any engineering work required by the specification
- g. Safety barricades for this work
- h. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- i. Furnish and Install all transitions strips/edge metal as required
- j. Coordinate with other trades as necessary
- k. Furnish and install all caulking needed for this bid category
- l. Any and all floor prep as required for proper installation
- m. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

05 05 53 Security Metal Fastenings (As applicable to this bid category)

07 92 00 Joint Sealants (As applicable to this bid category)

07 95 13.13 Interior Expansion Joint Cover Assemblies (As applicable to this bid category)

09 51 13 Acoustical Panel Ceilings

09 84 33 Sound-Absorbing Wall Units

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.

- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- f. Any engineering work required by the specification
- g. Safety barricades for this work
- h. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- i. Coordinate with other trades as necessary
- j. Furnish and install all caulking needed for this bid category
- k. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

07 92 00 Joint Sealants (As applicable to this bid category)

09 91 13 Exterior Painting

09 91 23 Interior Painting

09 93 00 Staining & Transparent Finishing

09 96 00 High-Performance Coatings

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.

- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- f. Include minor patching of existing walls
- g. Caulk and paint hollow metal frames and borrowed lites
- h. Refinishing of courtroom gallery seating as indicated on the plan
- i. Touch up Paint
- j. Include 100 hours of painting to be used as directed by the construction manager
- k. Any engineering work required by the specification
- l. Safety barricades for this work
- m. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- n. Coordinate with other trades as necessary
- o. Furnish and install all caulking needed for this bid category
- p. Priming and painting of detention doors as noted (new and reused)
- q. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

## BID CATEGORY #14 – PLUMBING

### 1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

#### **DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

#### **DIVISION 01 - GENERAL REQUIREMENTS**

02 41 19 Selective Demolition  
05 05 53 Security Metal Fastenings (As applicable to this bid category)  
07 84 13 Penetration Firestopping (As applicable to this bid category)  
07 84 43 Joint Firestopping (As applicable to this bid category)  
07 92 00 Joint Sealants (As applicable to this bid category)  
08 31 13 Access Doors and Frames (As applicable to this bid category)  
08 31 13.53 Security Access Doors and Frames (As applicable to this bid category)  
22 00 10 Plumbing General Provisions  
22 05 00 Common Work Results for Plumbing  
22 05 13 Common Motor Requirements for Plumbing Equipment  
22 05 16 Expansion Fittings and Loops for Plumbing Piping  
22 05 19 Meters and Gauges for Plumbing Piping  
22 05 23 General Duty Valves for Plumbing Piping  
22 05 29 Hangers and Supports for Plumbing Piping and Equipment  
22 05 48 Vibration Controls for Plumbing Piping and Equipment  
22 05 53 Identification for Plumbing Piping and Equipment  
22 07 00 Plumbing Insulation  
22 11 16 Domestic Water Piping  
22 11 23 Domestic Water Pumps  
22 13 16 Sanitary Waste and Vent Piping  
22 13 29 Sanitary Sewerage Pumps  
22 14 13 Facility Storm Drainage Piping  
22 15 16 Facility Natural Gas and Compressed Air Piping  
22 15 17 Facility Fuel-Oil Piping  
22 31 00 Domestic Water Softeners  
22 34 00 Fuel-Fired Domestic Water Heaters  
22 40 00 Plumbing Fixtures  
22 46 00 Security Plumbing Fixtures  
22 47 00 Drinking Fountains and Water Coolers

### 2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.



- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

### 3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Street cleaning and traffic control measures for this work
- c. Furnish and install all underground and above ground plumbing lines including water, sanitary/storm sewer, gas and air piping
- d. Coordination with other trades
- e. Caulking/Firestopping of penetrations thru floors, walls and ceilings
- f. Spoils to be removed from the site unless directed by CM or owner to remain on site
- g. Safety barriers for this work
- h. Removal/disposal of concrete floors as indicated
- i. Cutting and patching
- j. All existing plumbing systems must remain active to serve occupied spaces throughout the various phases of construction work
- k. Patch any openings associated with demolition of existing work to match adjacent surface
- l. Installation of owner supplied air compressor
- m. Remove and reinstall detention plumbing fixtures as noted
- n. Remove and reinstall drinking fountains as noted
- o. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Concrete slab replacement by BP#03

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

02 41 19 Selective Demolition

05 05 53 Security Metal Fastenings (As applicable to this bid category)

07 84 13 Penetration Firestopping (As applicable to this bid category)

07 84 43 Joint Firestopping (As applicable to this bid category)

07 92 00 Joint Sealants (As applicable to this bid category)

08 31 13 Access Doors and Frames (As applicable to this bid category)

08 31 13.53 Security Access Doors and Frames (As applicable to this bid category)

21 00 10 Fire Suppression General Provisions

21 05 00 Common Work Results for Fire Suppression

21 05 53 Identification for Fire Protection Piping and Equipment

21 10 00 Water-Based Fire Suppression Systems

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.

- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Street cleaning and traffic control measures for this work
- c. Coordination with other trades
- d. Caulking/Firestopping of penetrations thru floors, walls and ceilings
- e. Existing fire protection system to remain active at all times, if shutdowns are needed this contractor will provide fire watch
- f. Patch any openings associated with demolition of existing work to match adjacent surface
- g. Safety barriers for this work
- h. Cutting and patching
- i. Performance and payment bond

4. EXCLUDED ITEMS:

## BID CATEGORY #16 – HEATING, VENTILATION AND AIR CONDITIONING

### 1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

#### **DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

#### **DIVISION 01 - GENERAL REQUIREMENTS**

02 41 19 Selective Demolition  
05 05 53 Security Metal Fastenings (As applicable to this bid category)  
07 84 13 Penetration Firestopping (As applicable to this bid category)  
07 84 43 Joint Firestopping (As applicable to this bid category)  
07 92 00 Joint Sealants (As applicable to this bid category)  
08 31 13 Access Doors and Frames (As applicable to this bid category)  
08 31 13.53 Security Access Doors and Frames (As applicable to this bid category)  
08 91 19 Fixed Louvers  
23 00 10 HVAC General Provisions  
23 05 00 Common Work Results for HVAC  
23 05 13 Common Motor Requirements for HVAC Equipment  
23 05 16 Expansion Fittings and Loops for HVAC Piping  
23 05 19 Meters and Gauges for HVAC Piping  
23 05 23 General Duty Valves for HVAC Piping  
23 05 29 Hangers and Supports for HVAC Piping and Equipment  
23 05 48 Vibration Controls for HVAC Piping and Equipment  
23 05 53 Identification for HVAC Piping, Ductwork and Equipment  
23 05 93 Testing, Adjusting and Balancing for HVAC  
23 07 00 HVAC Insulation  
23 09 00 Building Automation System  
23 21 13 Hydronic Piping  
23 21 23 Hydronic Pumps  
23 23 00 Refrigerant Piping  
23 31 13 Metal Ducts  
23 33 00 Air Duct Accessories  
23 34 16 HVAC Fans  
23 36 00 Air Terminal Units  
23 37 13 Diffusers, Registers and Grilles  
23 51 00 Breeching, Chimneys, and Stacks  
23 52 16 Condensing Boilers  
23 62 00 Packaged Compressor and Condenser Units  
23 64 16 Centrifugal Water Chillers  
23 65 00 Cooling Towers  
23 73 13 Modular Indoor Central Station Air Handling Units  
23 74 13 Packaged Outdoor Central Station Air Handling Units  
23 81 28 Ductless Split System Air Conditioners  
23 82 16 Air Coils  
23 82 19 Fan Coil Units  
23 82 33 Convectors and Radiant Heaters  
23 82 39 Unit Heaters

### 2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.

- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

### 3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Include the cost of maintaining and changing filters and servicing equipment used during construction.
- c. Provide new filters on equipment after construction is complete
- d. Supply and install louvers and louvered equipment enclosures
- e. Street cleaning and traffic control measures for this work
- f. Coordination with other trades
- g. Caulking/Firestopping penetrations thru floors, walls and ceilings
- h. Patch any openings associated with demolition of existing work to match adjacent surface
- i. All existing HVAC equipment must remain active to serve occupied spaces throughout the various phases of construction work
- j. Cutting and patching

- k. Removal and proper disposal of all existing thermostats
- l. Provide temporary chiller as identified on the bid documents
- m. Include 300-man hours to be used as directed by the construction manager
- n. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule other than items indicated on the plans
- b. HVAC related concrete equipment pads by Bid Category #05 – Cast-In-Place Concrete
- c. Gas service fees and usage

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

02 41 19 Selective Demolition  
05 05 53 Security Metal Fastenings (As applicable to this bid category)  
07 84 13 Penetration Firestopping (As applicable to this bid category)  
07 84 43 Joint Firestopping (As applicable to this bid category)  
07 92 00 Joint Sealants (As applicable to this bid category)  
08 31 13 Access Doors and Frames (As applicable to this bid category)  
08 31 13.53 Security Access Doors and Frames (As applicable to this bid category)  
26 05 00 Common Work Results for Electrical  
26 05 19 Low-Voltage Electrical Power Conductors and Cables  
26 05 26 Grounding and Bonding for Electrical Systems  
26 05 29 Hangers and Supports for Electrical Systems  
26 05 33 Raceway and Boxes for Electrical Systems  
26 05 53 Identification for Electrical Systems  
26 05 73 Short-Circuit Coordination Study Arc Flash Hazard Analysis  
26 09 13 Electrical Power Monitoring and Sub-Metering  
26 09 23 Lighting Control Systems  
26 22 00 Low-Voltage Transformers  
26 24 13 Switchboards  
26 24 16 Panelboards  
26 27 26 Wiring Devices  
26 28 16 Enclosed Switches and Circuit Breakers  
26 29 13 Enclosed Controllers  
26 29 23 Variable-Frequency Motor Controllers  
26 32 13 Engine Generators  
26 33 23 Central Battery Equipment  
26 36 00 Transfer Switches  
26 43 13 Surge Protective Devices for Lower Electrical Power Circuits  
26 50 00 Lighting  
27 00 10 Communications General Provisions  
27 05 26 Grounding and Bonding for Communications Systems  
27 05 53 Identification for Communications Systems  
27 11 00 Communications Cabling and Equipment  
27 12 00 Telecommunications Testing and Documentation  
27 13 13 Communications Copper Backbone Cabling  
27 13 23 Communications Optical Fiber Backbone Cabling  
27 15 33 Communication Coaxial Horizontal Cabling  
27 45 00 Sound Masking System  
27 50 00 Intercom System  
27 51 29 Emergency Communication System  
27 60 00 Clock System  
28 00 10 Electronic Safety and Security General Provisions  
28 26 00 Electronic Personal Protection System  
28 31 00 Fire Alarm and Detection System  
28 50 00 Access Control System  
28 60 00 Video Surveillance  
28 80 00 Distributed Antenna System (DAS)



2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).
- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Street cleaning and traffic control measures for this work
- c. Coordination with other trades
- d. Caulking/Firestopping penetrations thru floors, walls and ceilings

- e. Temporary lighting and electrical power for construction activities
- f. Concrete work at light pole bases to include forms, rebar and placing of anchor bolts. Exposed areas are to be ground and rubbed
- g. Site lighting as indicated
- h. Cutting and patching
- i. Coordinate with Jefferson Utilities for temporary/permanent power needs for the project
- j. Patch any openings associated with demolition of existing work to match adjacent surface
- k. All existing electrical/communications/security systems must remain active to serve occupied spaces throughout the various phases of construction work
- l. Installation of detention security required raceways, cabling and terminations as indicated on security documents
- m. Include temporary electric service (including utility fees) and hookup/disconnect temporary chiller twice
- n. Performance and payment bond

4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.
- b. Electrical related concrete equipment pads by Bid Category #05 – Cast-In-Place Concrete

1. SCOPE OF WORK:

- a. Except for the items specifically noted below to be excluded, the work of this Bid Category shall include all labor, materials, equipment to complete work as identified below and per Contract and Division 1 General Requirements as listed in Construction Documents. Should any conflict exist between this written Scope of Work and the scope of work inferred by the Division 1 General Requirements or the Specification Sections listed below, the work required by this Bid Category description shall govern. Work of this Bid Category shall include the following Specification Sections:

**DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS**

**DIVISION 01 - GENERAL REQUIREMENTS**

05 05 53 Security Metal Fastenings (As applicable to this bid category)  
05 58 16 Formed Metal Enclosures  
07 92 00 Joint Sealants (As applicable to this bid category)  
07 92 16.13 Rigid Security Joint Sealants (As applicable to this bid category)  
08 31 13.53 Security Access Doors and Frames (As applicable to this bid category)  
08 34 63 Detention Doors and Frames  
08 71 63 Detention Door Hardware  
08 88 53 Security Glazing  
09 57 53 Security Ceiling Assemblies  
10 28 13.63 Detention Toilet Accessories  
11 98 00 Detention Equipment  
11 98 19 Detention Room Padding  
12 36 16.13 Detention Metal Countertops  
12 55 00 Detention Furniture

2. GENERAL REQUIREMENTS INCLUDED BUT NOT LIMITED TO:

- a. Provide project manager and qualified onsite supervisor (changes to personnel will require CM approval)
- b. Daily coordination with other trades whose work is interfaced with the work of this Bid Category and as required for the completion of the work of all Bid Categories.
- c. Any and all layout, grades, elevations, dimensioning and engineering required to complete the work of this Bid Category and as further described in Division 1 requirements.
- d. Verify all existing elevations and dimensions relative to work of this Bid Category prior to start of the work.
- e. All labor, materials, equipment, tools, incidental hardware required to receive, unload, store, protect and install all the work of this Bid Category as well as installation of materials supplied by other Bid Categories that are required to be installed by this Bid Category. If unloading of equipment/materials is required to be done by the construction manager with their rough terrain forklift this will be billed to the bid category subcontractor at \$150 per hour with a one-hour minimum charge (this cost includes the operator).
- f. Bid category contractor will be provided pdf file of the construction documents, it is the responsibility of the subcontractor to print their own copies for use.
- g. Bid Category Contractor is responsible to verify that any previous work completed that has a direct effect on the work of this category is complete and acceptable prior to commencing with work. Contractor will notify the Construction Manager of any discrepancies immediately for correction by responsible Contractor.
- h. Bid category contractor work will require multiple mobilizations, no additional mobilization cost will be accepted.
- i. Provide daily clean up and trash removal of all debris as a result of this Bid Categories work. All work areas are to be maintained in a safe and accessible manner at all times.
- j. Bid Category Contractor is aware of delivery requirements of the Project Schedule included in the Construction Documents and assumes responsibility to complete all work of this Bid Category to meet the Project Schedule requirements. This contractor will, within seven (7) days of Notice of Award, submit a preliminary schedule detailing work of this Bid Category to comply with the time requirements of Project Schedule.
- k. Bid category contractor to include all fees and permit costs that pertain to their scope of work.
- l. Bid category contractor is required to sign the construction managers subcontract agreement included in the project manual (no modifications to the contract permitted).

- m. At completion of work, restore any site areas disturbed by construction activity of this Bid Category to originally graded condition as was provided to this contractor at the start of work.
- n. Submit to Construction Manager written requests for clarification or interpretation of the meaning and/or intent of the Construction Documents at either time of bidding or during construction.
- o. Provide a project specific Safety Program to Construction Manager.
- p. By submitting a bid for this Bid Category, the Bidding Contractor has implied that he/she has visited the site, is familiar with the project's local conditions and has factored these conditions into the bid submitted. Furthermore, Bidding Contractor warrants that the work can be completed per the Construction Documents based on the site visit observations and has taken into consideration the existing physical conditions that may affect the work of this Bid Category and that all such costs to complete the work of this Bid Category due to existing project site conditions are included in the bid submitted.
- q. If weather conditions are a factor in completion of this Bid Categories work, Contractor is to provide documentation substantiating normal weather conditions anticipated and included in submitted bid.
- r. Background checks are required for all workers onsite. County will perform background checks at no cost. There is also a zero-tolerance agreement required to be signed for all employees working in the law enforcement center.

### 3. SPECIFIC ITEMS TO INCLUDE:

- a. All requirements of Specification Sections as noted in Scope of Work above.
- b. Safety barricades for this work
- c. Associated layout for this work (Maas Brothers will only provide site boundaries, building corners, and a benchmark elevation one time)
- d. Street cleaning and traffic control measures for this work
- e. Any engineering work required by the specification
- f. Safety barricades for this work
- g. Furnish all necessary fasteners, shims, etc. for a complete installation of all items associated with the work of this bid category
- h. Coordinate with other trades as necessary
- i. Provide all security sealants as required including those required by the MEP trades
- j. Furnish and install all caulking/security caulking needed for this bid category
- k. Detention frames will be grouted by the masonry contractor, but this contractor will assist with setting of frames to be grouted by others
- l. All other frames set by this contractor shall include grouting
- m. Removal and reinstallation of detention doors to be reused (Including any field measuring for new frames and coordination of new hardware)
- n. Include allowance for 40 lineal feet of soffi-steel (05 59 63 Detention Enclosures)
- o. Removal and reinstallation of existing bunks at Women's Huber Dorm including patching of floor to match where floor anchors were removed
- p. Performance and payment bond

### 4. EXCLUDED ITEMS:

- a. Construction Manager will provide temporary heating equipment, gas and electric usage required for winter construction per the base bid construction schedule.

## **ADVERTISEMENT FOR BIDS**

BIDS: AUGUST 11, 2022

FOR THE JEFFERSON COUNTY COURTHOUSE  
AND SHERIFF'S BUILDING RENOVATION &  
ADDITIONS

CONSTRUCTION MANAGER:  
MAAS BROTHERS CONSTRUCTION  
410 WATER TOWER CR  
WATERTOWN, WI 53094-0108  
(920) 261-1682

ARCHITECT:  
POTTER LAWSON, INC.  
MADISON, WI

BID OPENING: August 11, 2022 shortly after bid  
deadline.

**BIDS MUST BE RECEIVED BY: AUGUST 11,  
2022 at 1:00 PM LOCAL TIME.**

Sealed Bids for the project designated above will be  
received at:

**311 SOUTH CENTER AVENUE  
ROOM 111  
JEFFERSON, WI 53549**

All bids will be publicly opened and read at the  
specified time and date indicated above by the Owner  
or his designee.

This will be bid in MULTIPLE BID CATEGORIES to  
be executed under a Construction Manager At Risk.  
The work will include remodeling County  
Administrative Departments, Courts, Sheriff's  
Department, and Jail to improve security, functional  
efficiencies, and accommodate future growth. This  
project includes Administrative, Courts, and Law  
Enforcement Center additions, totaling over 36,000 sf.  
Renovations cover approximately 105,500 sf, of which  
57,600 sf is considered Level 2 remodeling. Extensive  
mechanical, electrical, plumbing and technology  
systems are to be replaced or upgraded. A fire  
protection/sprinkler system will be added to the  
Courthouse side of the facility. Site work includes  
updating miscellaneous site utilities including adding a  
storm water system along S. Center Ave. The current  
MIS building located at 402 S. Center Ave is to be  
demolished allowing for the County parking lot just  
south of the site to be expanded.

All Bids must be on a stipulated lump sum basis.

Electronic copies of the above documents may be  
requested on or after July 22, 2022 from Maas Brothers  
Construction by sending an email to  
[mstafford@maasbros.com](mailto:mstafford@maasbros.com). The following information  
must be included in the email; requestor's name,  
company name, physical address, telephone number  
and email address.

A Voluntary Pre-Bid Inspection Tour will be held on  
July 28<sup>th</sup>, 2022 at 12:00 PM, beginning in Room 202.

Bid Security in the amount of five (5) percent of the  
Bid must accompany each Bid in accord with the  
Instructions to Bidders.

The bidding and letting of Contracts herein advertised  
is subject to compliance with all applicable statutory  
requirements. The Owner is considered a qualifying  
exempt entity, therefore Section 77.54(9m), Wis. Stats.  
sales and use tax exemption will be utilized on this  
project.

The Owner reserves the right to waive irregularities and  
to accept any bid, reject any and all bids, and upon  
acceptance of any bid, to thereafter accept revisions or  
modifications on such bid.

The Advertisement for Bids is issued by authority of  
Jefferson County, Wisconsin.

July 13, 2022

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## **INSTRUCTIONS TO BIDDERS**

### **PART 1 - GENERAL**

#### **1.1 INSTRUCTIONS TO BIDDERS**

- A. To be considered, Bids must be made in accord with these Instructions to Bidders.

#### **1.2 DOCUMENTS**

- A. In order to maintain a list of "Bidders of Record", all Bidders shall identify themselves and the portion or type of work they are bidding.

#### **1.3 BID CATEGORIES**

- A. Bidders shall submit a single Base Bid for individual Bid Categories. A separate envelope is to be submitted for each individual Bid Category that the Contractor wishes to bid. The Bid Form does allow for Combined Bids, but this does not relieve the requirement for separate envelopes for individual Bid Categories.
- B. Bids shall conform to the Bid Categories as scheduled in the Construction Manager's Bid Category list in Section 00 10 13.

#### **1.4 EXAMINATION**

- A. Carefully examine the Procurement Documents which include the proposed Contract Documents and the construction site to obtain first-hand knowledge of existing conditions. Each Bidder, by submitting its bid, represents that Bidder has examined the Procurement Documents, inspected the site, understands the provisions of the Procurement Documents, and has become familiar with the local conditions under which the Work is to be performed. Bidders will not be entitled to extra payments or Contract Time extensions for conditions which could have been determined by carefully examining the site, subsurface information, and the Procurement Documents.
- B. A voluntary inspection and tour of the existing building will be conducted on Thursday, July 28th, 2022 at 12:00 PM. Bidders shall meet at Room 202 of the project site. Bidders shall arrive early enough to clear security prior to the start of the tour. Statements made during the inspection and tour contrary to the Contract Documents shall not be construed as a change to the Contract Documents, unless included in a subsequent addendum. Clarification requests shall be submitted as pre-bid RFIs at least 10 days prior to bid date.

#### **1.5 ADDENDA**

- A. All changes in or interpretations of the Procurement Documents prior to the bid opening will be made by written addenda issued by the Architect to each recipient of the Procurement Documents recorded by the Architect. All addenda will be issued not later than 24 hours prior to bid opening.

#### **1.6 PROOF OF COMPETENCY OF BIDDER**

- A. Any Prime Bidder may be required to furnish evidence satisfactory to the Owner that the Bidder and proposed subcontractors have sufficient means, expertise, financial ability, and experience in the types of work Bid to assure completion of the Contract in a satisfactory manner.
- B. Any Bidder may be required to furnish evidence satisfactory to the Construction Manager that the Bidder has sufficient means, expertise, financial ability, and experience in the types of work Bid to assure completion of the Contract in a satisfactory manner.

## 1.7 QUESTIONS

- A. Submit all questions about the Procurement Documents to the Architect, in writing, not later than 10 days prior to Bid Date. Replies will be issued to all Bidders of Record as Addenda to the Procurement Documents and will become part of the Contract. The Architect, Construction Manager and Owner will not be responsible for oral clarification. Questions received after this time cannot be answered.

## 1.8 SUBSTITUTIONS

- A. To obtain approval to use unspecified products, submit Substitution Request Form not later than 10 days prior to Bid Date. Requests received after this time will not be considered. Utilize Substitution Request Form at the end of Section 01 25 00. If the Product is acceptable, the Architect will so indicate by Addendum issued to all Bidders of Record. Refer to Section 00 26 00 of the Specifications for additional information.

## 1.9 PREPARATION OF BIDS

- A. Prepare Bids on unaltered Bid Forms bound in the Project Manual. Submit two copies. Bids shall be signed with name typed below signature. Where Bidder is a corporation, Bids must be signed with the legal name of the corporation followed by the name of the State of incorporation and the legal signature of an officer authorized to bind the corporation to Contract. Do not submit Project Manual with Bid.

## 1.10 ALTERNATIVE BIDS

- A. Where Alternative Bids are required in the Bid Form, Bidders shall fill in each alternative bid with a bid price. There will be no division of awards between Base Bid and accepted alternative bids.

## 1.11 UNIT PRICE ITEMS

- A. When unit price items are included in the Procurement Documents, the bidder shall indicate, in figures, a unit price for each separate item. The acceptance of bid unit prices shall be a condition of contract award.

## 1.12 SUBCONTRACTOR LIST

- A. A list of Major Subcontractors is not required with Bid. However, to be considered for contract award, the three lowest Bidders must submit the names of Subcontractors for Plumbing work, Fire Protection work, HVAC work, and Electrical work to A/E within 48 hours after bid opening. Deliver Subcontractor List to Construction Manager for submission to the Architect and Owner.

## 1.13 BID SECURITY

- A. Make Bid Security payable to Jefferson County in the amount of five (5) percent of the Bid Sum. Security shall be either certified check or bid bond issued by surety licensed to conduct business in the State of Wisconsin. The successful Bidder's security will be retained until Bidder has signed a Contract and furnished the required payment and performance bonds. The Owner will retain the security of all Prime Bidders until the successful bidder enters into Contract or until 45 days after bid opening, whichever is the shorter. If any Bidder refuses to enter into a Contract, the Owner will retain Bidder's Bid Security as liquidated damages, but not as a penalty. Submit Bid Security with Bid.



- 1.14 PERFORMANCE BOND AND LABOR AND MATERIALS PAYMENT BOND
- A. After bid opening, the Owner may require each successful Bidder to obtain and furnish a Performance Bond and Labor and Materials Payment Bond. Owner will pay the cost of such bonds. See Section 01 23 00 "Alternates."
- 1.15 SUBCONTRACTORS
- A. The Owner reserves the right to reject any and all Subcontractors. In the event the Owner exercises this right, the Contract Sum may be reviewed and negotiated accordingly.
- 1.16 SUBMITTAL
- A. Submit Bid and Bid Security in an opaque sealed envelope. Identify the envelope with Project name, and name of Bidder and Contract Number. Submit Bids in accord with the Advertisement for Bids. Do not submit Project Manual with Bid. Facsimile bids not acceptable.
- B. Security: Take note that there is a security checkpoint to be cleared in order to submit bids. It is recommended bidders leave sufficient time to get through security prior to the bid submittal deadline.
- 1.17 MODIFICATION AND WITHDRAWAL
- A. Bids may not be modified after submittal. Bidders may withdraw Bids at any time before bid opening, but may not resubmit them. No Bid may be withdrawn or modified after the bid opening except where the award of Contracts has been delayed for more than 45 days from day of Bid opening.
- 1.18 DISQUALIFICATION
- A. The Owner reserves the right to disqualify Bids, before or after opening upon evidence of collusion with intent to defraud or other illegal practices upon the part of the Bidder.
- 1.19 OPENING
- A. Bids will be opened as announced in the Advertisement for Bids.
- 1.20 AWARD
- A. The Contract, if awarded, will be awarded to the lowest qualified and responsible Bidder on the basis of the Base Bid and full consideration of all Alternatives, as may be in the best interest of the Owner. In determining responsibility, the Owner will consider the scope of the work involved, time of delivery, competency of Bidder, Bidder's ability to render satisfactory service, and past performance.
- B. The Construction Manager and Owner will review all Bids including Bidders qualifications after the bid opening.
- C. The Owner reserves the right to waive irregularities and accept any Bid, reject any and all Bids, and upon acceptance of any Bid, to thereafter accept revisions or modifications on such Bid.
- D. If two or more Bidders submit identical Bids, the Owner may make award to that Bidder of Owner's choice, and such decision shall be final.
- E. Awards will not be made to any Bidder in default of a Contract with the Owner, or to any Bidder having as an agent or employee any individual previously in default or guilty of misrepresentation.

1.21 NOTICE TO PROCEED

- A. Written notice of award to a Bidder in the form of an email from the Construction Manager delivered to the email address shown on the Bid Form will be considered sufficient notice of acceptance of Bid, intent to award the Contract, and "Notice to Proceed" with the Work.

1.22 EXECUTION OF AGREEMENT

- A. The Agreement Forms which the accepted Bidder, as Contractor, will be required to execute is indicated in the Project Manual.
- B. The accepted Bidder shall assist and cooperate with the Construction Manager in preparing the formal Agreement, and within ten days following its presentation shall execute same and return it to the Construction Manager. Failure to execute Agreement and return it to Construction Manager within time indicated shall be considered by Construction Manager as refusal by accepted Bidder to enter into the Contract.
- C. At or prior to delivery of the signed Agreement, the Contractor shall deliver to the Construction Manager the Performance Bond and Labor and Material Payment Bond and the policies of insurance or insurance certificates as required by the Contract Documents, if this option is accepted by the Owner. All bonds and policies of insurance shall be approved by the Construction Manager before the accepted Bidder may proceed with the Work.
- D. Failure or refusal to furnish bonds or insurance policies or certificates in a timely manner and in a form satisfactory to the Construction Manager shall not serve to waive any requirements of the Contract Documents, including time of completion.

1.23 COMPLETION DATE

- A. Owner requires a completion and occupancy date of September 6, 2024. Demolition of MIS building and subsequent parking lot installation shall occur subsequent to substantial completion. Prime Bidders shall indicate on their Bid Form the date by which they can complete the Work and Owner can occupy, if award of contract is made within 45 days after bid opening.

End of Instructions to Bidders

ID		Task Name	Duration	Start	Finish	Predecessors
1		<b>Phase One - Additions (Per Phasing Plan)</b>	<b>316 days</b>	<b>Fri 7/22/22</b>	<b>Wed 10/18/23</b>	
2		Bidding & Contract Award (Including County Meetings)	27 days	Fri 7/22/22	Mon 8/29/22	
3		Mobilization	5 days	Tue 8/30/22	Tue 9/6/22	2
4		Selective Demolition at Building Additions	13 days	Wed 9/7/22	Fri 9/23/22	3
5		Site Clearing/Earthwork/Site Utilities	25 days	Mon 9/19/22	Fri 10/21/22	4FS-5 days
6		Footings/Foundations/Backfill	45 days	Mon 9/26/22	Tue 11/29/22	5FS-20 days
7		Structural Steel (16 Week Lead Time)	45 days	Thu 12/8/22	Fri 2/10/23	
8		Temporary Enclosures/Heat	35 days	Mon 1/2/23	Fri 2/17/23	7FS-30 days
9		Concrete Topping	40 days	Mon 1/9/23	Fri 3/3/23	8FS-30 days
10		Steel Studs/Dens Glass/Insulation (Exterior Perimeter)	45 days	Mon 1/23/23	Fri 3/24/23	9FS-30 days
11		Roofing	20 days	Mon 3/6/23	Fri 3/31/23	10FS-15 days
12		AL Windows	15 days	Mon 4/3/23	Fri 4/21/23	11
13		Exterior Masonry/Siding	30 days	Mon 4/24/23	Mon 6/5/23	12
14		Interior Partition Walls	35 days	Mon 4/24/23	Mon 6/12/23	12
15		MEP Rough In	45 days	Mon 4/24/23	Mon 6/26/23	12
16		Drywall/Painting	25 days	Tue 6/27/23	Tue 8/1/23	15
17		Finishes (ACT Ceiling, Flooring, Cabinets)	25 days	Wed 8/2/23	Wed 9/6/23	16
18		MEP Finish/Temp	15 days	Thu 9/7/23	Wed 9/27/23	17
19		Owner Move-In	15 days	Thu 9/28/23	Wed 10/18/23	18
20						
21		****AHU/Electrical Panels Delivery****	1 day	Tue 8/15/23	Tue 8/15/23	4FS+225 days
22						
23						
24		<b>Phase One - Renovation of Existing (Per Phasing Plan)</b>	<b>265 days</b>	<b>Tue 10/4/22</b>	<b>Wed 10/18/23</b>	
25		Asbestos Abatement (Preliminary Estimate)	25 days	Tue 10/4/22	Mon 11/7/22	19FS-265 days
26		Selective Demolition	50 days	Tue 11/8/22	Fri 1/20/23	19FS-240 days
27		MEP Rough-In	70 days	Tue 11/22/22	Fri 3/3/23	26FS-40 days
28		Interior Partition Walls (Steel Studs/Masonry)	50 days	Thu 12/8/22	Fri 2/17/23	26FS-30 days
29		Drywall/Painting	50 days	Mon 2/20/23	Fri 4/28/23	27FS-10 days
30		Finishes (ACT Ceiling, Flooring, Cabinets)	55 days	Mon 4/24/23	Tue 7/11/23	29FS-5 days
31		MEP Finish/Temp	45 days	Wed 7/12/23	Wed 9/13/23	30
32		Owner Move-In	25 days	Thu 9/14/23	Wed 10/18/23	31
33						

Task

Split

Progress

Milestone

Summary

Project Summary

External Tasks

External Milestone

Deadline





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## **DOCUMENT 002600 - PROCUREMENT SUBSTITUTION PROCEDURES**

### **PART 1 -**

#### **1.1 DEFINITIONS**

- A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Procurement and Contracting Documents, submitted prior to receipt of bids.
- B. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See Section 01 25 00 "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

#### **1.2 QUALITY ASSURANCE**

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

#### **1.3 PROCUREMENT SUBSTITUTIONS**

- A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.
- B. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
  - 1. Extensive revisions to the Contract Documents are not required.
  - 2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
  - 3. The request is fully documented and properly submitted.

#### **1.4 SUBMITTALS**

- A. Procurement Substitution Request: Submit to Construction Manager. Procurement Substitution Request must be made in writing in compliance with the following requirements:
  - 1. Requests for substitution of materials and equipment will be considered if received no later than 10 days prior to date of bid opening.
  - 2. Submittal Format: Submit copies of each written Procurement Substitution Request, using form bound in Project Manual following section 01 25 00.
  - 3. Submittal Format: Submit Procurement Substitution Request, using format provided on Project Web site.
    - a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and drawing numbers.
    - b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
      - 1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
      - 2) Copies of current, independent third-party test data of salient product or system characteristics.
      - 3) Samples where applicable or when requested by Architect.

- 4) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
  - 5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - 6) Research reports, where applicable, evidencing compliance with building code in effect for Project, from ICC-ES.
  - 7) Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.
- c. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Procurement and Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
  - d. Bidder, in submitting the Procurement Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Procurement Substitution Request.
- B. Architect's Action:
1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Procurement and Contracting Documents.
- C. Architect's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

END OF DOCUMENT **002600**



## **DOCUMENT 003119 - EXISTING CONDITION INFORMATION**

### **1.1 EXISTING CONDITION INFORMATION**

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. Existing drawings that include information on existing conditions including previous construction at Project site are available for viewing upon request to the Construction Manager.
- C. Survey information that includes information on existing conditions, prepared by Point of Beginning, Inc., dated September 22, 2021, is available for viewing as part of Drawings.
- D. Photographic model of existing conditions that includes photographic documentation on existing conditions, prepared by Design Engineers is available upon request to the Construction Manager.
- E. Related Requirements:
  - 1. Document 002113 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.
  - 2. Document 003132 "Geotechnical Data" for reports and soil-boring data from geotechnical investigations that are made available to bidders.

END OF DOCUMENT 003119

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## **DOCUMENT 003132 - GEOTECHNICAL DATA**

### **1.1 GEOTECHNICAL DATA**

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information. This Document and its attachments are not part of the Contract Documents.
- B. Because subsurface conditions indicated by the soil borings are a sampling in relation to the entire construction area, and for other reasons, the Owner, the Architect, the Architect's consultants, and the firm reporting the subsurface conditions do not warranty the conditions below the depths of the borings or that the strata logged from the borings are necessarily typical of the entire site. Any party using the information described in the soil borings and geotechnical report shall accept full responsibility for its use.
- C. A geotechnical investigation report for Project, prepared by Giles Engineering Associates, Inc., dated October 14, 2021, is available for viewing as appended to this Document.
  - 1. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
  - 2. Any party using information described in the geotechnical report shall make additional test borings and conduct other exploratory operations that may be required to determine the character of subsurface materials that may be encountered.
- D. Related Requirements:
  - 1. Document 002113 "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.
  - 2. Document 003119 "Existing Condition Information" for information about existing conditions that is made available to bidders.

END OF DOCUMENT 003132

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# **Geotechnical Engineering Exploration and Analysis**

**Proposed Improvements  
Jefferson County Courthouse & Sherriff Building  
S. Center Avenue  
Jefferson, Wisconsin**

**Prepared for:**

**Jefferson County  
Jefferson, Wisconsin**

**October 14, 2021  
Project No. 1G-2109011**



**GILES**  
ENGINEERING ASSOCIATES, INC.



# GILES

## ENGINEERING ASSOCIATES, INC.

GEOTECHNICAL, ENVIRONMENTAL & CONSTRUCTION MATERIALS CONSULTANTS

- Atlanta, GA
- Dallas, TX
- Los Angeles, CA
- Manassas, VA
- Milwaukee, WI

October 14, 2021

Jefferson County  
311 S. Center Avenue  
Jefferson, WI 53549

Attention: Mr. Ben Wehmeier  
County Administrator

Subject: Geotechnical Engineering Exploration and Analysis  
Proposed Improvements  
Jefferson County Courthouse and Sherriff Building  
S. Center Avenue  
Jefferson, Wisconsin  
Giles Project No. 1G-2109011

Dear Mr. Wehmeier:

As requested, Giles Engineering Associates, Inc. conducted a *Geotechnical Engineering Exploration and Analysis* for the proposed project. The accompanying report describes the services that were performed, and it provides geotechnical-related findings, conclusions, and recommendations that were derived from those services.

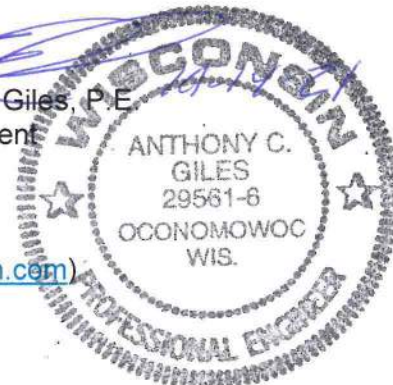
We sincerely appreciate the opportunity to provide geotechnical services for the proposed project. Please contact the undersigned if there are questions about the report, or if we may be of further service.

Very truly yours,

GILES ENGINEERING ASSOCIATES, INC.

Andrew J. Globig, E.I.T.  
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# GEOTECHNICAL ENGINEERING EXPLORATION AND ANALYSIS

## PROPOSED IMPROVEMENTS JEFFERSON COUNTY COURTHOUSE & SHERIFF BUILDING S. CENTER AVENUE JEFFERSON, WISCONSIN PROJECT NO. 1G-2109011

### 1.0 SCOPE OF SERVICES

This report provides the results of the *Geotechnical Engineering Exploration and Analysis* that Giles Engineering Associates, Inc. ("Giles") conducted for the proposed project. The *Geotechnical Engineering Exploration and Analysis* included a geotechnical subsurface exploration program, geotechnical laboratory services, and geotechnical engineering. The scope of each service area was narrow and limited, as directed by our client, and based on our understanding and assumptions about the project. Service areas are briefly described later. Environmental-related consulting services were beyond Giles' scope for this project.

Geotechnical-related recommendations are provided in this report for design and construction of the foundations, basement, and at-grade floors for the proposed additions. Pavement recommendations are also provided. Site preparation recommendations are included, but these recommendations are only preliminary because the means and methods of site preparation will depend on factors that were unknown when this report was prepared. Those factors include, but are not limited to, the weather before and during construction, the subsurface conditions that are exposed during construction, and the final details of the proposed project.

### 2.0 SITE DESCRIPTION

The subject site is at the southwest corner of the S. Center Avenue and E. Dodge Street intersection, in Jefferson, Wisconsin. The site area is shown on the *Test Boring Location Plan*, enclosed as Figure 1 in Appendix A. When the test borings (described later) were conducted, the Jefferson County Courthouse and Sheriff Building occupied the site along with a parking lot, grassy areas, and other improvements, such as sidewalks and landscape areas. Topographic contour lines on the *Topographic Survey* (revised September 22, 2021), prepared by Point of Beginning, show that ground grades at the site range between  $\pm$ El. 797 and  $\pm$ El. 811.

### 3.0 PROJECT DESCRIPTION

#### Proposed Additions

The proposed project will include four additions to the Jefferson County Courthouse and Sheriff Building. Proposed locations of the additions are shown on the *Test Boring Location Plan*. It is assumed that the additions will be one- to two-story masonry structures. Bearing walls will assumedly support the additions, possibly along with interior columns. Maximum foundation loads were not provided but are assumed to be 5,000 pounds per lineal foot (plf) from bearing walls and 150 kips per column. It is understood that the northeast and northwest additions will have basements. And, for each of these additions, the basement floor will be 10'-4" below the at-grade floor. It is assumed that the basement walls will be constructed of reinforced cast-in-place concrete. The two other additions are planned to be slab-on-grade structures. The maximum floor





load for ground-bearing floor slabs, including floor slabs within basements, is assumed to be 100 pounds per square foot (psf). It is understood that the at-grade floor of each addition will match the at-grade floor of the existing building. Therefore, only minor grade changes are expected in the addition areas, but the basement excavations are expected to be a maximum of about 11½ feet deep, including footing excavations.

#### Proposed Parking Lot

A parking lot will be constructed at the southeast corner of the S. Center Avenue and E. Linden Drive intersection, as shown on the *Test Boring Location Plan*. It is understood that new pavement will consist of asphalt-concrete. Because Giles was not provided with traffic information, the pavement recommendations provided herein are based on arbitrarily assumed traffic conditions. Also, this report assumes that pavement surface grades will be within about two feet of the current ground grades.

#### **4.0 GEOTECHNICAL SUBSURFACE EXPLORATION PROGRAM**

To explore subsurface conditions, nine test borings were conducted at the site using a mechanical drill-rig. Test Borings 1 through 7 were in the proposed addition areas and were advanced to ±21 feet below-ground, except that Test Boring 2 was terminated at ±17 feet due to auger refusal, which was likely caused by cobbles or boulders. Test Borings 8 and 9 were in the proposed parking lot area and were advanced to ±11 feet below-ground. Test boring locations were positioned on-site based on the existing site features and by estimating right angles. Approximate locations of the test borings are shown on the *Test Boring Location Plan*.

Samples were collected from each test boring, at certain depths, using the Standard Penetration Test (SPT), conducted with the drill rig. A brief description of the SPT is given in Appendix B along with descriptions of other field procedures. Immediately after sampling, select portions of the SPT samples were placed in containers that were labeled at the site for identification. A Standard Penetration Resistance value (N-value) was determined from each SPT. N-values are reported on the *Test Boring Logs* (in Appendix A), which are records of the test borings.

The boreholes were backfilled upon completion; however, backfill materials will likely settle or heave, creating a hazard that can injure people and animals. Borehole areas should, therefore, be carefully and routinely monitored by the property owner or by others; settlement and heave of backfill materials should be repaired immediately. Giles will not monitor or repair boreholes.

Ground elevations at the test borings were estimated using topographic contour lines on the *Topographic Survey*. The test boring elevations are noted on the *Test Boring Logs* and are considered accurate within about one foot.



## 5.0 GEOTECHNICAL LABORATORY SERVICES

Samples that were retained from the test borings were transported to Giles' geotechnical laboratory, where the samples were classified using the descriptive terms and particle-size criteria shown on the *General Notes* in Appendix D and by using the Unified Soil Classification System (ASTM D 2488) as a general guide. Classifications are shown on the *Test Boring Logs* along with horizontal lines that show estimated depths of material change. Field-related information pertaining to the test borings is also shown on the *Test Boring Logs*. For simplicity and abbreviation, terms and symbols are used on the *Test Boring Logs*; the terms and symbols are defined on the *General Notes*.

Calibrated penetrometer resistance, unconfined compression (without measured strain), and moisture content tests were performed on select SPT samples to evaluate their general engineering properties. Because SPT samples were used, which are categorized as disturbed samples, results of the penetrometer resistance tests are approximate. Results of the laboratory tests are on the *Test Boring Logs*. Laboratory procedures are briefly described in Appendix C.

## 6.0 MATERIAL CONDITIONS

Because material sampling at the test borings was discontinuous, it was necessary to estimate conditions between sample intervals. Estimated conditions at the test borings are briefly discussed in this section and are described in more detail on the *Test Boring Logs*. The conclusions and recommendations in this report are based only on the estimated conditions.

### 6.1. Surface Materials

About 4 inches of asphalt-concrete pavement was at the surface of Test Boring 7. The asphalt pavement was underlain by about 7 inches of base course material. Topsoil, classified as fill, was at the surface of the other test borings. The topsoil was about 9 to 12 inches thick and generally consisted of silty clay, sandy clay, silty sand, and gravelly silty sand.

### 6.2. Fill Material

At Test Borings 2 through 9, material classified as fill was beneath the surface materials and extended to depths between  $\pm 2$  and  $\pm 9$  feet below-ground. The fill material was variable but generally consisted of silty clay, sandy clay, and silty sand. The fill at Test Boring 3 included wood debris, and the fill at Test Boring 5 included concrete rubble. Based on field and laboratory testing, existing fill material exhibited variable strength characteristics between relatively low and somewhat high.



### **6.3. Native Soil**

Native soil was below the materials described above and extended to the termination depth at each test boring. The native soil generally consisted of silty clay and gravelly silty sand. Native silty clay exhibited very stiff and hard comparative consistencies, based on laboratory testing. SPT N-values within native gravelly silty sand typically correlate to relative densities between firm and very dense, but at least some of the measured N-values are likely not representative of in-place density because gravel, cobbles, or boulders were encountered during testing. Native soil likely includes many cobbles and boulders.

## **7.0 GROUNDWATER CONDITIONS**

Based on the moisture conditions of the retained soil samples, it is estimated that the water table was about 11 to 16 feet below-ground at the test boring locations when the test borings were conducted. However, the water table will fluctuate and might be shallower at certain times. It is important to note that the groundwater conditions discussed above are only an estimate; if a precise determination of the groundwater conditions is needed, groundwater observation wells are recommended to be installed and monitored at the site. Giles can install and monitor groundwater observation wells.

## **8.0 CONCLUSIONS AND RECOMMENDATIONS**

### **8.1. Seismic Design Considerations**

A soil Site Class C is recommended for seismic design. By definition, Site Class is based on the average properties of subsurface materials to 100 feet below-ground. Because 100-foot test borings were not requested or authorized for the project, it was necessary to estimate the Site Class based on the test borings, presumed area geology, and the International Building Code.

### **8.2. Building Addition Foundation Recommendations**

A spread-footing foundation is recommended for each addition. However, existing fill is unsuitable for direct or indirect support of foundations. Each footing must bear on suitable native soil or on new engineered fill or lean-concrete backfill (both discussed below) placed on suitable native soil. Based on Test Borings 1 through 7 (conducted in the proposed addition areas), foundations for the proposed additions are recommended to be designed using a 4,000 psf maximum, net, allowable soil bearing capacity. For geotechnical considerations and regardless of the calculated foundation-bearing stress, strip footings are recommended to be at least 18 inches wide, and isolated footings are recommended to be at least 24 inches wide and long. It is recommended and assumed that a structural engineer will provide specific foundation details, including footing dimensions, reinforcing, etc.



A minimum 48-inch foundation-embedment depth is required by the building code. It is, therefore, recommended that footings for perimeter walls and other exterior elements of the additions bear at least 48 inches below the adjacent finished ground-grade. Interior footings within the additions can bear directly below the floor slab, assuming that the additions will be heated and support soil will not freeze. However, it is recommended that foundations for the additions bear at the same elevation as the existing foundations, assuming that the required embedment depth will be met for frost protection. Therefore, extension of the addition foundations might be necessary to match the bearing elevation of existing foundations.

A frictional coefficient of 0.29 is recommended to determine the lateral resistance of the foundations. The recommended frictional coefficient is only for concrete cast directly on suitable native soil or on new engineered fill or lean-concrete backfill used to replace unsuitable materials. Lateral resistance due to friction should be determined based on dead load only. Also, the ultimate lateral resistance determined from the frictional coefficient is recommended to be factored to determine an allowable value. Passive resistance is recommended to be neglected to at least the recommended 48-inch foundation-embedment depth due to seasonal changes and due to the amount of lateral movement necessary to develop full passive pressure.

The following table provides estimated depths of native soil that is suitable for direct foundation support (based on the recommended 4,000 psf bearing capacity) at the building-area test borings. It is important to note that suitable native soil might be at deeper depths away from the test borings, and along the existing building, where existing fill will likely be encountered; therefore, testing and approval of foundation-support soil by a geotechnical engineer during construction is critical. Without testing and approval of foundation-support soil by a geotechnical engineer, the additions could be improperly supported.

TABLE 1 ESTIMATED DEPTH/ELEVATION OF SUITABLE BEARING NATIVE SOIL		
Test Boring Number	Estimated Depth of Suitable Native Soil	Estimated Elevation of Suitable Native Soil
1	±2 feet	±El. 796.3
2	±4 feet	±El. 797.3
3	±3 feet	±El. 804.0
4	±6½ feet	±El. 805.0
5	±6½ feet	±El. 802.8
6	±6½ feet	±El. 804.3
7	±9 feet	±El. 801.1
<ul style="list-style-type: none"> <li>• For direct foundation support, or for placement of engineered fill or lean-concrete backfill; based on a 4,000 psf maximum, net, allowable soil bearing capacity.</li> <li>• Referenced to the site grades during the geotechnical subsurface exploration program.</li> <li>• Elevations are referenced to the elevations shown on the <i>Test Boring Logs</i>.</li> </ul>		



Foundation excavations are recommended to be dug with a smooth-edge backhoe bucket to develop a relatively undisturbed bearing grade. A toothed bucket will likely disturb foundation-bearing soil more than a smooth-edge bucket, thereby making soil at the excavation base more susceptible to saturation and instability, especially during adverse weather. It is critical that contractors protect foundation-support soil and foundation construction materials (concrete and reinforcing). Furthermore, engineered fill is recommended to be placed and compacted in benched excavations along foundation walls immediately after the foundation walls can properly support lateral pressures from backfill, compaction, and compaction equipment. Earth-formed footing construction techniques are expected to be feasible within cohesive site soil, but foundation forms might be needed within granular site soil.

#### Foundation Support Soil Requirements

Existing fill is unsuitable for direct or indirect support of foundations. Each footing must bear on suitable native soil or on new engineered fill or lean-concrete backfill (both discussed below) that is placed on suitable native soil. Based on the recommended 4,000 psf maximum, net, allowable soil bearing capacity, the in-situ unconfined compressive strength of cohesive native soil, such as silty clay, within foundation influence zones is recommended to be at least 2 tons per square foot (tsf). Native granular soil, such as gravelly silty sand, within foundation influence zones is recommended to have a corrected N-value (determined from SPTs and correlated from other in-situ tests) of at least 14, based on the recommended bearing capacity. It is further recommended that the strength characteristics of soil within all foundation influence zones (determined by a geotechnical engineer during construction) meet or exceed the recommended values, unless Giles approves other values.

Evaluation of foundation-support soil by a geotechnical engineer during foundation excavation and immediately before foundation construction is critical, especially considering the existing development and existing fill. The purpose of the evaluation is (1) to confirm that the foundations will be properly supported by suitable native soil, (2) to determine where over-excavation is needed, and (3) to confirm that the support soils are similar to those described on the *Test Boring Logs*. If a firm other than Giles performs the recommended support-soil evaluation, Giles must be notified if the composition or strength characteristics of foundation-support soils differ from those shown on the *Test Boring Logs*; revision of this report might be necessary. Without evaluation and approval of foundation-support soil by a geotechnical engineer, the proposed additions could be improperly supported, which could lead to excessive settlement and other structural problems.

Unsuitable materials beneath foundation areas possibly could be replaced with engineered fill consisting of dense-graded crushed stone that meets the gradation requirements of *dense-graded base* (1¼-inch) in Section 305 of the Wisconsin Department of Transportation Standard Specifications (2019). Granular material with other gradation characteristics could possibly be used but should be approved by a geotechnical engineer before the material is placed. If engineered fill is used as backfill, lateral over-excavation of unsuitable materials will also be



required, in addition to the required vertical over-excavation. The overall width of lateral over-excavation will depend on the vertical over-excavation depth. For estimating purposes, the minimum lateral over-excavation could be determined by extending an imaginary line outward and downward at a ratio of 1(horizontal):2(vertical) from the bottom edges of a footing pad, but the actual lateral extents of over-excavation are recommended to be approved by a geotechnical engineer during construction.

Lean Portland cement concrete (minimum 28-day compressive strength of 1,000 psi) could also be used to replace unsuitable materials beneath foundation areas and is Giles' preferred backfill material. Where lean concrete is used as backfill, footing construction must not begin until the lean concrete has gained sufficient strength. Also, over-excavations that are filled with lean concrete are recommended to be at least as wide (on all sides) as the footing pad that will be supported by the concrete, and excavation sidewalls are recommended to be plumb and parallel. To help control caving, lean-concrete backfill is recommended to be placed immediately after excavation. This trench-and-pour method requires close communication and scheduling between the general contractor, foundation contractor, concrete supply company, and geotechnical engineer. With a trench-and-pour method, a geotechnical engineer must observe excavations as they are made. Full-time observation by a geotechnical engineer is recommended.

#### Existing Construction Considerations

Precautions must be taken to protect the existing building during construction and to ensure that excavations do not undermine or otherwise compromise the existing building or other existing site improvements. If a void develops below existing footings or floor slabs, a geotechnical engineer should immediately observe the conditions and provide repair recommendations. In general, voids should be immediately filled with a concrete dry-pack, or an expansive sand-and-cement slurry (non-shrink) should be injected into the void, under appropriate pressure, to redevelop contact between the foundation and supporting soils.

Near the existing building, it is recommended that foundations for the additions bear at the same elevation as the adjacent (existing) foundations, assuming that the required 48-inch embedment depth will be met, where required. If the new and existing footings will bear at different elevations, a structural engineer should evaluate the stresses to be imposed on the lower foundation and confirm that the structural integrity of the existing building and additions will be maintained. Control joints should separate the existing building and the addition since some differential movement is expected at these junctures. Excavations must not be performed within the zone of influence (determined by a geotechnical engineer) of an existing footing; otherwise, existing footings could be undermined, possibly causing significant (and catastrophic) damage.



Where new foundations are perpendicular to an existing foundation, it might be necessary to cantilever new foundations a certain distance away from the existing building to help reduce potential settlement of the existing building due to overlapping stress from the new construction. When the existing and proposed foundation systems and depths can be confirmed, Giles should be contacted to evaluate whether our recommendations need to be updated. Care must be taken to protect the existing building during construction of the additions. The existing building should be underpinned and braced, where needed. Extra care should be exercised not to undermine existing footings during removal of unsuitable materials or during construction of the new footings.

It is assumed that the proposed additions will be self-supporting structures and that no structural load will be imposed on the existing building due to the additions. If load is added to the existing building, it will likely undergo some settlement. The amount and location of settlement will partly depend on the magnitude and location of the load increase. Differential settlement should be expected between the existing building and the additions, even if additional load will not be imposed on the existing building.

#### Estimated Foundation Settlement

The post-construction total and differential settlements of a spread-footing foundation designed and constructed based on this report are estimated to be less than about 1 inch and ½ inch, respectively. The post-construction angular distortion is estimated to be less than about 0.002 inch per inch across 20 feet. Estimated settlements assume that the recommendations provided in this report will be followed and that foundation-support soil will be evaluated and approved by a geotechnical engineer during construction.

### **8.3. Basement Recommendations**

It is understood that the northeast and northwest additions will have full basements. Geotechnical-related recommendations regarding the proposed basements are provided in this section. The recommendations assume that, for each addition, the basement floor (surface) will be at ±El. 801.5 and will match the existing basement floor. The recommendations also assume that basement foundations will bear at ±El. 800.2. Giles must be notified if the floor slabs or foundations will be lower than assumed; revision of this report might be necessary.

#### Basement Floor Slab

Assuming a maximum 100 psf floor load, and from a geotechnical perspective, basement floor slabs are recommended to be at least 4 inches thick; this thickness assumes that the 28-day compressive strength of concrete will be at least 3,500 pounds per square inch (psi). Basement floor slabs could be designed based on a *Modulus of Subgrade Reaction* ( $K_{v1}$ ) value of 125



pounds per square inch per inch (psi/in). It is recommended and assumed that a structural engineer will specify the floor slab thickness, reinforcing, joint details, and other parameters.

For moisture control only, a minimum 10-mil vapor retarder is recommended to be directly below the basement floor slabs. It is recommended that the vapor retarder completely underlie the entire floor area and extend to all foundation walls. Abutting vapor retarders are recommended to be overlapped at least 6 inches, and the overlaps are recommended to be fully taped. Vapor retarders are recommended to be in accordance with ASTM E 1745, entitled *Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs*, and other relevant documents. If the base course has sharp, angular aggregate, protecting the retarder with geotextile (or other means) is recommended.

A minimum 8-inch-thick base course is recommended to be directly below the minimum 10-mil vapor retarder to serve as a capillary break and for sub-slab drainage. Because the base course will be a component of the recommended drainage system (discussed below), it is recommended that the base course consist of crushed stone that meets the gradation requirements of ASTM No. 57 aggregate. Base material is recommended to be properly compacted. Also, it is recommended that a geotechnical engineer approve base material before it is placed. Geotextile might need to be below the base material to serve as a separator. The need for geotextile should be determined with the assistance of a geotechnical engineer during construction.

The post-construction total and differential settlements of an isolated floor slab constructed in accordance with this report are estimated to be less than about ½ inch and ¼ inch, respectively, over about 20 feet. Estimated settlements assume that support soil will be thoroughly tested and approved by a geotechnical engineer.

#### Foundation Drainage System Recommendations

Continuous drainpipes are recommended to be along the interior and exterior sides of perimeter strip footings. Drainpipes could consist of conduits specifically manufactured for foundation drainage applications, such as Form-A-Drain® conduits. Manufactured foundation drains are recommended to be installed per the manufacturer's recommendations. Circular drainpipes could also be used and are recommended to be minimum 4-inch-diameter perforated pipes suitable for foundation drainage. Circular drainpipes are recommended to be directly adjacent to the footing pads, not atop footing flanges. Interior drainpipes are to be properly situated within the base course layer below the basement floor slab. Due to possible clogging, fabric socks are not recommended to be used with foundation drainpipes. It is recommended that a minimum 12-inch-thick layer of free-draining crushed stone (ASTM No. 57 aggregate) surround exterior drainpipes, but the crushed stone must not extend below the foundations and into the foundation-influence zone. Bleeder pipes are recommended to be cast in the perimeter strip-footing pads to serve as water conduits between interior and exterior drainpipes. Bleeder pipes are recommended to be 3 inches in diameter and about 8 to 12 feet on-center.





It is recommended that the foundation drainpipes, for each addition, discharge to a sump basin within each basement area. Locations of the basins should be determined based on architectural and structural details of the additions. It is recommended that each basin have a sealed-and-bolted airtight lid to prevent inflow of subsurface gases, such as radon. Also, if feasible, each basin should drain by gravity directly to a storm sewer. If gravity drainage is not feasible, each basin should be equipped with a sump pump that has a sufficient capacity. Each sump pump is recommended to be equipped with a backup generator to maintain pump operation in the event of a power outage. The sump pumps should discharge directly to a storm sewer. Because sump-pump operation could be frequent and possibly continuous at times, the sump pumps should not discharge to the ground surface since pumped water will likely pond, becoming a nuisance and hazard.

#### Drainage Backfill

Free-draining aggregate is recommended to be placed along the basement walls to serve as drainage media for the recommended drainage systems. It is recommended that the free-draining aggregate consist of crushed stone that meets the gradation requirements of ASTM No. 57 aggregate. The aggregate layer is recommended to be at least two feet wide, measured from the outside face of the basement walls. Also, the aggregate layer is recommended to be continuous along the length and height of the walls, except that pavement or a  $\pm 6$ -inch-thick layer of relatively impervious material is recommended to be above the drainage aggregate to reduce surface-water intrusion. Furthermore, the aggregate layer must extend to the base of the perimeter strip-footing pads, thereby creating a continuous drainage path to the perimeter drainage conduits. It is recommended that a geotechnical engineer approve drainage backfill before it is placed.

Drainage backfill that is placed adjacent to basement walls is recommended to be compacted in maximum 8- to 12-inch-thick lifts, measured loose. The use of manual compaction equipment must be in strict accordance with current OSHA excavation and trench safety standards and other applicable requirements. Manual compaction equipment must not be used within spaces that do not meet OSHA requirements. Also, heavy compaction equipment, such as mechanical rollers, should be kept at least 10 feet from basement walls because high lateral pressures could develop, possibly causing the walls to move laterally and fail. Also, drainage backfill should not be excessively compacted. Excavations for the basement areas must be properly sloped, benched, or restrained. Basement walls are recommended to be adequately braced before placing backfill to prevent the walls from moving or possibly even overturning during backfilling and compaction. Bracing must remain in-place until the walls are structurally restrained.

#### Lateral Pressure Design Parameters

Basement walls must be designed to resist lateral pressures from drainage backfill, adjacent soil, and any surface and subsurface surcharges. An equivalent "at-rest" fluid pressure of 65 pounds per square foot per foot of depth (psf/ft) is recommended for design of basement walls. The recommended "at-rest" value is based on Giles' assumption that drainage backfill will continuously



abut the basement walls and that the, for each addition, the recommended drainage system will be installed and will remain functional. If drainage backfill or the drainage system are not installed, lateral pressures could exceed the recommended "at-rest" fluid pressure, possibly exceeding the lateral capacity of the walls.

Lateral pressures caused by surface and subsurface surcharge loads must be added to the "at-rest" fluid pressure. Giles can provide supplemental recommendations regarding surface and subsurface surcharge loads on a case-by-case basis but would require specific structural information. Basement walls that are not designed to resist actual pressures could move laterally and possibly fail. It is recommended and assumed that a structural engineer will design the basement walls.

#### **8.4. At-Grade Floor Slab Recommendations**

With proper subgrade preparation, existing soil (including existing fill) is expected to be suitable to support at-grade floor slabs for the proposed additions; new engineered fill that is placed on properly prepared existing soil is also expected to be suitable. However, subgrade improvement might be necessary to develop proper slab support, considering the existing fill. Consequently, all at-grade floor areas are recommended to be thoroughly evaluated and approved by a geotechnical engineer immediately before fill placement and before floor construction. Without a thorough evaluation of floor slab support materials, at-grade floor slabs might be improperly supported, which could lead to excessive settlement and other structural problems.

From a geotechnical perspective and based on a maximum 100 psf floor load, at-grade floor slabs for the proposed additions are recommended to be at least 4 inches thick; this thickness assumes that the 28-day compressive strength of concrete will be at least 3,500 pounds per square inch (psi). Assuming proper site preparation, the floor slabs may be designed using a *Modulus of Subgrade Reaction* ( $K_{v1}$ ) value of 100 pounds per square inch per inch (psi/in). It is recommended and assumed that a structural engineer will specify the actual floor slab thickness, reinforcing, joint details, and other parameters.

A minimum 4-inch-thick base course is recommended to be below the floor slabs to serve as a capillary break and for support considerations. It is recommended that the base course consist of free-draining aggregate that has been tested and approved by a geotechnical engineer. Depending on aggregate gradation and the subgrade conditions, geotextile might need to be below the base material to serve as a separator. The need for geotextile should be determined during construction with the assistance of a geotechnical engineer.

A minimum 10-mil vapor retarder is recommended to be directly above or below the base course throughout all at-grade floor areas. The position (above or below the base course) of the vapor retarder should be specified by the project structural engineer or architect. Abutting vapor retarder sheets are recommended to be overlapped at least 6 inches, and the overlaps are recommended to be fully taped. Also, it is recommended that vapor barriers extend to all foundation walls. Vapor



retarders are recommended to be in accordance with ASTM E 1745, entitled *Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs*, and other relevant documents. If the base course has sharp, angular aggregate, protecting the retarder with geotextile (or by other means) is recommended.

Due to the frost-susceptible site soil, areas of the at-grade floor slabs (such as near exterior doors and entrance-exit vestibules) might be susceptible to freeze-thaw related movement. Installation of insulation (or other protective measures against freeze-thaw movement) should be considered for these areas. Pavement and ground grades are recommended to be sloped away from the existing building, proposed additions, and sidewalks to reduce water infiltration and potential freeze-thaw problems.

#### Estimated Floor Slab Settlement

The post-construction total and differential settlements of an isolated floor slab constructed in accordance with this report are estimated to be less than about  $\frac{5}{8}$  inch and  $\frac{1}{3}$  inch, respectively, over about 20 feet. Estimated settlements assume that the addition areas will be prepared per this report, and that floor slab support materials will be thoroughly tested and approved by a geotechnical engineer during construction.

### **8.5. Pavement Recommendations**

Giles was not given traffic-related information for pavement design; therefore, the pavement recommendations provided herein are based on an arbitrarily assumed traffic condition consisting of five 18-kip Equivalent Single Axle Loads (ESALs) per day. The recommended pavement sections given below are for light-duty pavement areas subject to passenger vehicles. The recommended pavement sections assume no increase in traffic volume and no changes in vehicle type or traffic pattern. Also, it is assumed that the five 18-kip ESALs will be in one direction for each lane.

The project owner, developer, civil engineer, and other design professionals involved with the project should confirm that five 18-kip ESALs are appropriate for the expected traffic conditions. If requested, Giles will provide supplemental pavement recommendations based on other traffic conditions. The recommended pavement sections could underperform or fail prematurely if the design ESALs are exceeded.

Based on Test Borings 8 and 9, it is expected that pavement subgrade will include variable fill materials. Therefore, the recommended pavement sections shown below were developed based on an assumed field CBR value of 4 and a field *Modulus of Subgrade Reaction* ( $K_{V1}$ ) of 100 psi/in. Engineered fill that is placed in proposed pavement areas is recommended to have a field CBR value and a field *Modulus of Subgrade Reaction* ( $K_{V1}$ ) value at least equal to the design values. Also, the fill is recommended to be placed and compacted per this report.



### Asphalt-Concrete Pavement

The following table shows the recommended thicknesses for HMA pavement with an aggregate base course. State specifications are also included in the table. The recommended HMA pavement section is based on the traffic condition described above.

<b>TABLE 2 RECOMMENDED ASPHALT-CONCRETE PAVEMENT</b>		
<b>Materials</b>	<b>Thickness</b>	<b>Wisconsin DOT Standard Specifications</b>
Hot-Mix Asphalt Surface Course	1.5 inches	Section 460
Hot-Mix Asphalt Binder Course	2.0 inches	Section 460
Dense-Graded Aggregate Base Course	8.0 inches	Section 305

### Portland Cement Concrete Pavement

For light-duty conditions, a minimum 6-inch-thick Portland cement concrete (PCC) pavement with a minimum 4-inch-thick compacted aggregate base course is recommended for higher-stress areas, such as at entrance and exit aprons. Concrete for PCC pavement should have a minimum 28-day compressive strength of 4,000 psi with 4 to 7 percent air entrainment. Control-joint spacing should be determined in accordance with the current ACI code. Expansion joints should be provided where pavement abuts fixed objects, such as light-pole foundations. Materials and construction procedures for concrete pavement and the aggregate base course are recommended to be in accordance with Wisconsin DOT Standard Specifications Section 415 and Section 305, respectively.

### General Pavement Considerations

The pavement recommendations assume that the pavement subgrade will be prepared per this report, the base course will be properly drained, and a geotechnical engineer will observe and monitor pavement construction. Pavement was designed based on a twenty-year design period; however, maintenance and repair of the pavement is expected to be necessary, especially considering the existing fill. Local codes may require specific testing to determine soil support characteristics, or a minimum pavement section might be required.

## **8.6. Generalized Site Preparation Recommendations**

This section deals with site preparation, including preparation of floor slab, pavement, and engineered fill areas. The means and methods of site preparation will greatly depend on the weather conditions before and during construction, the subsurface conditions that are exposed



during earthwork operations, and the finalized details of the proposed development. Therefore, only generalized site preparation recommendations are given.

In addition to being generalized, the following site preparation recommendations are abbreviated; the *Guide Specifications* in Appendix D gives further recommendations. The *Guide Specifications* should be read along with this section. Also, the *Guide Specifications* are recommended to be used as an aid to develop the project specifications.

#### Removal and Stripping

All components of existing and former structures are recommended to be removed from the proposed addition areas. Disposal of rubble and debris is recommended to be in accordance with local, state, and federal regulations for the material type. Within the proposed parking lot area, it might be feasible for existing foundations to remain, provided the foundations are stable, are cut off at least three feet below the planned subgrade, and hollow cores are grouted solid. Existing floor slabs within the proposed parking lot area could also stay in place, provided the slabs are at least three feet below the planned finished grade, are perforated (broken) on a maximum two-foot grid, are “seated” into the subgrade for stability, and are covered with a minimum 12-inch-thick layer of well-graded, free-draining granular material for drainage. It is important to note that building remnants that are left in place may cause excavation difficulties for new utilities and landscape plantings, and for future construction. Remnants that are left in place will likely be susceptible to frost-heave. Excavations created during removal of construction components must be backfilled with engineered fill, which might need to be benched into the surrounding soil, as noted in Item No. 3 of the *Guide Specifications* enclosed in Appendix D.

Pavement, surface vegetation, trees and bushes (including root-balls), topsoil, and other unsuitable materials are recommended to be removed from the proposed addition areas, pavement area, and other structural areas. Stripping and removal should extend at least several feet beyond the proposed development areas, where feasible. Existing pavement should remain in place as long and possible to protect the underlying soil.

#### Proof-Rolling and Fill Placement

After the recommended removal and stripping, and once the improvement areas are cut (lowered) as needed, the subgrade within each improvement area is recommended to be proof-rolled with a fully-loaded tandem-axle dump truck (or other suitable construction equipment) to locate unstable areas based on subgrade deflection caused by the wheel loads of the proof-roll equipment. However, proof-roll equipment must be kept a sufficient distance from the existing building and other existing construction, as existing construction could be damaged during proof-rolling. Also, for safety, proof-roll equipment must be kept a sufficient distance from excavations. It is recommended that a geotechnical engineer observe proof-roll operations and evaluate subgrade stability based on those observations. Areas that cannot be proof-rolled (such as near



the existing building) are recommended to be evaluated and approved by a geotechnical engineer using appropriate means and methods.

Due to the existing fill and existing developments, unsuitable materials might be encountered during proof-rolling and testing. Unsuitable materials are recommended to be removed and replaced with engineered fill or improved. Recommendations for subgrade improvement should, however, be made by a geotechnical engineer based on the site conditions during construction. Areas requiring subgrade improvement should be defined during construction with the assistance of a geotechnical engineer. Specific improvement methods should be determined during construction on an area-by-area basis.

The improvement areas are recommended to be raised, where necessary, to the planned finished grades with engineered fill immediately after each subgrade is confirmed to be stable and suitable to support the proposed site improvements. Engineered fill is recommended to be placed in thin layers (lifts) that are uniform in elevation. Each layer of engineered fill is recommended to be compacted to at least 95 percent of the fill material's maximum dry density determined from the Standard Proctor compaction test (ASTM D 698). As an exception, the in-place dry density of engineered fill within one foot of a pavement subgrade is recommended to be compacted to at least 100 percent of the fill's maximum dry density. The water content of fill material is recommended to be uniform and within a narrow range of the optimum moisture content, also determined from the Standard Proctor compaction test. Item Nos. 4 and 5 of the *Guide Specifications* give more information pertaining to selection and compaction of engineered fill.

Care must be taken not to damage the existing building or other existing construction during compaction of engineered fill. In some areas (such as along foundation walls of the existing building), it will likely be necessary to use walk-behind vibratory compaction equipment, possibly along with imported aggregate fill material. Also, vibratory compaction equipment should not be used near groundwater (including perched groundwater), since vibratory compaction near groundwater could cause soil to become unstable.

Engineered fill that does not meet the density and water content requirements is recommended to be replaced or scarified to a sufficient depth (likely 6 to 12 inches, or more), moisture-conditioned, and compacted to the required density. A subsequent lift of fill should only be placed after a geotechnical engineer confirms that the previous lift was properly placed and compacted. Subgrade soil will likely need to be recompacted immediately before construction, since equipment traffic and adverse weather may reduce soil stability.

#### Use of Site Soil as Engineered Fill

Site soil that does not contain adverse organic content or other deleterious materials, as noted in the *Guide Specifications*, could be used as engineered fill. However, site soil will likely need to be moisture conditioned (uniformly moistened or dried) prior to being used as engineered fill. If construction is during adverse weather (discussed in the following section), drying site soil will



likely not be feasible. In this case, fill material will likely need to be imported to the site. Additional recommendations regarding fill selection, placement, and compaction are given in the *Guide Specifications*.

## **8.7. Generalized Construction Considerations**

### Adverse Weather

Site soil is moisture sensitive and will become unstable when exposed to adverse weather, such as rain, snow, and freezing temperatures. Therefore, it might be necessary to remove or stabilize the upper 6 to 12 inches (or more) of soil due to adverse weather, which commonly occurs during late fall, winter, and early spring. At least some over-excavation or stabilization of unstable soil should be expected if construction is during or after adverse weather. Because site preparation is weather dependent, bids for site preparation and other earthwork activities should consider the time of year that construction will be conducted.

To protect soil from adverse weather, the site is recommended to be smoothly graded and contoured during construction to divert surface water away from construction areas. Contoured subgrades are recommended to be rolled with a smooth-drum compactor, before precipitation, to “seal” the surface. Furthermore, construction traffic should be restricted to certain aggregate-covered areas to control traffic-related soil disturbance. Foundation, floor slab, and pavement construction should begin immediately after suitable support is confirmed.

### Dewatering

Water that accumulates in construction areas is recommended to be removed along unsuitable soil as soon as possible. Filtered sump pumps, drawing water from sump pits excavated in the bottom of construction trenches, are expected to be adequate to remove water that collects in shallow excavations. Multiple sump pumps might be necessary. Excavated sump pits should be fully lined with geotextile and filled with free-draining crushed stone, such as crushed stone that meets the gradation requirements of ASTM No. 57 aggregate.

### Excavation Stability

Excavations are recommended to be made in accordance with current OSHA excavation and trench safety standards and other applicable requirements. Where required, sides of excavations must be sloped, benched, or braced to develop and maintain a safe work environment. Temporary shoring must be designed according to applicable regulatory requirements. Contractors are responsible for excavation safety. Excavations will be susceptible to caving.



### Existing Utilities

All existing utilities are recommended to be identified and located, and any planned to be maintained should be relocated outside the addition areas. Utilities that are not reused should be capped-off and removed in accordance with local codes and ordinances. Excavations for the removal of utilities are recommended to be backfilled with engineered fill placed under engineering-controlled conditions. Grading operations must be done carefully so that existing utilities are not damaged or disturbed. Utility elevations, locations, and types should be checked relative to the planned construction to identify any concerns.

### **8.8. Recommended Construction Materials Testing Services**

This report was prepared assuming that a geotechnical engineer will perform Construction Materials Testing ("CMT") services during construction of the proposed development. Supplemental geotechnical recommendations may be needed based on the results of CMT services and specific details of the project not known at this time.

## **9.0 BASIS OF REPORT**

This report is strictly based on the project description given in Section 3.0. Giles must be notified if the project description or our assumptions are not accurate so that this report can be amended, if needed. This report assumes that the facility will be designed and constructed according to the codes that govern construction at the site.

The conclusions and recommendations in this report are based on estimated subsurface conditions as shown on the *Test Boring Logs*. Giles must be notified if the subsurface conditions that are encountered during construction of the proposed development differ from those shown on the *Test Boring Logs*; revision of this report might be necessary. General comments and limitations of this report are given in the appendix.

The conclusions and recommendations in this report have been promulgated in accordance with generally accepted professional engineering practices in the field of geotechnical engineering. No other warranty is either expressed or implied.





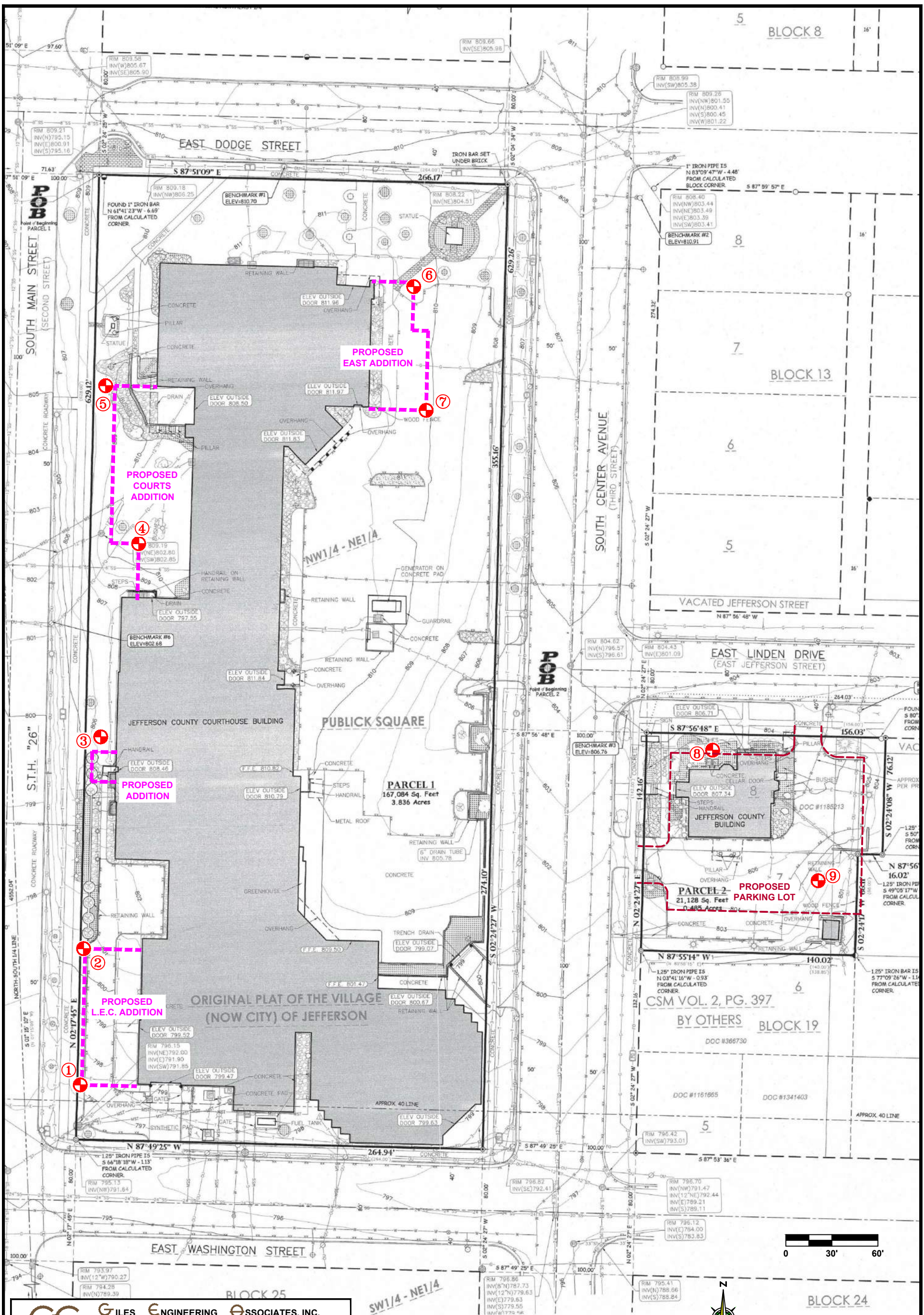
## **APPENDIX A**

### **FIGURES AND TEST BORING LOGS**

The Test Boring Location Plan contained herein was prepared based upon information supplied by *Giles'* client, or others, along with *Giles'* field measurements and observations. The diagram is presented for conceptual purposes only and is intended to assist the reader in report interpretation.

The Test Boring Logs and related information enclosed herein depict the subsurface (soil and water) conditions encountered at the specific boring locations on the date that the exploration was performed. Subsurface conditions may differ between boring locations and within areas of the site that were not explored with test borings. The subsurface conditions may also change at the boring locations over the passage of time.







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FIGURE 1  
TEST BORING LOCATION PLAN  
PROPOSED ADDITIONS  
JEFFERSON COUNTY COURTHOUSE AND SHERIFF BUILDING  
402 - 411 SOUTH CENTER AVENUE  
JEFFERSON, WISCONSIN

DESIGNED	DRAWN	SCALE	DATE	REVISED
DMC/AJG	<i>Jed</i>	approx. 1"=60'	10-14-21	--
PROJECT NO.: 1G-2109011			CAD No. 1g2109011-blp2	


LEGEND:

-  ① GEOTECHNICAL TEST BORING
-  PROPERTY LINE

NOTES:






- 1.) TEST BORING LOCATIONS ARE APPROXIMATE.
- 2.) PROPOSED FEATURES ARE APPROXIMATE BASED ON THE "SITE PLAN", DATED 7-21-2020, PREPARED BY POTTER LAWSON.
- 3.) BASE MAP DEVELOPED FROM THE "TOPOGRAPHIC SURVEY", REV. 9-22-2021, PREPARED BY POINT OF BEGINNING.




<b>BORING NO. &amp; LOCATION:</b> 1	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 798.3 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/24/21			
<b>FIELD REP:</b> KEITH FLOWERS			



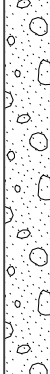
MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±12" Topsoil Fill: Very Dark Gray Silty Clay, little Organic Matter and Sand, trace Gravel-Moist			1-SS	6						
Brown Silty Clay, little Sand, trace Gravel-Moist			2-SS	11		4.1		20		
	5	795	3-SS	15	6.2	4.5+		20		
			4-SS	18		3.0		23		
	10	790	5-SS	31						
		785								
	15		6-SS	41						
		780								
	20		7-SS	41						

Boring Terminated at about 21 feet (EL. 777.3')






Water Observation Data	Remarks:
<div>  Water Encountered During Drilling: 16 ft. </div> <div>  Water Level At End of Drilling: </div> <div>  Cave Depth At End of Drilling: 14.9 ft. </div> <div>  Water Level After Drilling: </div> <div>  Cave Depth After Drilling: </div>	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

<b>BORING NO. &amp; LOCATION:</b> 2	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 801.3 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/24/21			
<b>FIELD REP:</b> KEITH FLOWERS			


MATERIAL DESCRIPTION		Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>u</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±10" Topsoil Fill: Dark Brown and Brown Sandy Clay, little Organic Matter, trace Gravel-Moist			800	1-SS	9		4.5+		14		
				2-SS	24						
Brown Gravelly Silty Sand-Moist		5	3-SS	14							
			795	4-SS	27						
			10	5-SS	66/8"						
				790	6-SS						
			(Includes Cobbles and Boulders below ±9 feet)		15						
785											



Auger Refusal  
Boring Terminated at about 17 feet (EL. 784.3')

	Water Observation Data	Remarks:
	Water Encountered During Drilling:	(a) Poor Recovery
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling: 10 ft.	
	Water Level After Drilling:	
	Cave Depth After Drilling:	






Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT 1G2109011.GPJ GILES.GDT 10/14/21

<b>BORING NO. &amp; LOCATION:</b> 3	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 807 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/24/21			
<b>FIELD REP:</b> KEITH FLOWERS			


MATERIAL DESCRIPTION		Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±12" Topsoil Fill: Dark Brown Gravelly Silty Sand, trace Organic Matter-Moist				1-SS	12						
Fill: Dark Brown and Brown Silty fine to medium Sand (Includes Wood debris)-Moist			805	2-SS	16						
Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Moist to Wet at ±16 feet											
		5		3-SS	10						
			800	4-SS	22						
		10		5-SS	15						
			795								
		15		6-SS	35						
			790								
		20		7-SS	13						

Boring Terminated at about 21 feet (EL. 786")

Water Observation Data		Remarks:
	Water Encountered During Drilling: 16 ft.	
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling: 14 ft.	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT 1G2109011.GPJ GILES.GDT 10/14/21


<b>BORING NO. &amp; LOCATION:</b> 4	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 811.5 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/24/21			
<b>FIELD REP:</b> KEITH FLOWERS			

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±10" Topsoil Fill: Dark Brown and Brown Silty fine Sand, trace Gravel and Organic Matter-Moist			1-SS	11						
Fill: Brown Silty fine Sand-Moist		810	2-SS	15						
	5		3-SS	10						
		805	4-SS	28						
Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Moist to Wet at ±16 feet	10		5-SS	27						
		800								
	15		6-SS	50						
		795								
	20		7-SS	44						

Boring Terminated at about 21 feet (EL. 790.5')






Water Observation Data	Remarks:
<div>▽</div> Water Encountered During Drilling: 16 ft.	
<div>▼</div> Water Level At End of Drilling:	
<div>⋯</div> Cave Depth At End of Drilling: 14 ft.	
<div>▼</div> Water Level After Drilling:	
<div>⋯</div> Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.


<b>BORING NO. &amp; LOCATION:</b> 5	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 809.3 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/24/21			
<b>FIELD REP:</b> KEITH FLOWERS			




MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±9" Topsoil Fill: Dark Gray Silty Clay, little Sand and Organic Matter-Moist  Fill: Dark Brown and Brown Silty Clay, little Sand, trace Gravel (Includes Concrete rubble)-Moist			1-SS	10						
			2-SS	11						
Fill: Brown Sandy Clay, trace Silt and Gravel-Moist  Brown Silty Clay, little Sand-Moist	5	805	3-SS	8						
			4-SS	9						
	10	800	5-SS	10	4.5	4.5+		18		
			6-SS	17						
Brown Gravelly Silty Sand, trace Clay (Includes Cobbles and Boulders)-Moist to Wet at ±16 feet	20	790	7-SS	18				20		

Boring Terminated at about 21 feet (EL. 788.3')






	Water Observation Data	Remarks:
	Water Encountered During Drilling: 16 ft.	
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

<b>BORING NO. &amp; LOCATION:</b> 6	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 810.8 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/27/21			
<b>FIELD REP:</b> KEITH FLOWERS			


MATERIAL DESCRIPTION		Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±12" Topsoil Fill: Dark Brown and Brown Silty Clay, little Sand and Organic Matter-Moist			810	1-SS	5						
Fill: Brown Sandy Clay, trace Silt-Moist				2-SS	6	2.1	2.5		16		
		5		3-SS	8		1.7		12		
			805								
Brown Silty Clay, little Sand-Moist				4-SS	11	5.6	4.5+		21		
				5-SS	12	5.8	4.5+		22		
		10									
			800								
Brown Gravelly Silty Sand, trace Clay (Includes Cobbles and Boulders)-Moist to Wet at ±16 feet											
				6-SS	18						
		15									
			795								
		20		7-SS	18						
			790								

Boring Terminated at about 21 feet (EL. 789.8')

	Water Observation Data	Remarks:
	Water Encountered During Drilling: 16 ft.	
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling: 14.9 ft.	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.




<b>BORING NO. &amp; LOCATION:</b> 7	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 810.1 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN
<b>COMPLETION DATE:</b> 09/27/21			
<b>FIELD REP:</b> KEITH FLOWERS			
PROJECT NO: 1G-2109011			

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±4" Asphalt-Concrete										
±7" Base Course			1-SS	7		3.7		14		
Fill: Very Dark Gray Sandy Clay, trace Gravel-Moist			2-SS	4				15		
Fill: Brown Sandy Clay, trace Gravel-Moist										
	5	805	3-SS	6	2.5	2.5		16		
Fill: Dark Brown and Brown Silty fine to medium Sand-Moist			4-SS	7						
Brown Silty Clay, little Sand-Moist	10	800	5-SS	11	4.5	4.1		13		
Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Wet										
	15	795	6-SS	9						
	20	790	7-SS	32						

Boring Terminated at about 21 feet (EL. 789.1')






Water Observation Data	Remarks:
<div>▽</div> Water Encountered During Drilling: 12 ft. <div>▼</div> Water Level At End of Drilling: <div>⋯</div> Cave Depth At End of Drilling: <div>▼</div> Water Level After Drilling: <div>⋯</div> Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

<b>BORING NO. &amp; LOCATION:</b> 8	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 804.7 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/27/21			
<b>FIELD REP:</b> KEITH FLOWERS			


MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±12" Topsoil Fill: Dark Gray Silty Clay, little Sand and Organic Matter-Moist			1-SS	4						
Fill: Dark Brown and Brown Silty fine Sand-Moist			2-SS	5						
Fill: Brown Sandy Clay with fine to medium Sand lenses-Moist	5	800	3-SS	6		3.0		19		
Brown Silty Clay, little Sand-Moist			4-SS	18	4.3	3.8		22		
	10	795	5-SS	12	3.9	3.5		22		

Boring Terminated at about 11 feet (EL. 793.7')

Water Observation Data		Remarks:
<div>  </div> <div>  </div> <div>  </div> <div>  </div> <div>  </div>	Water Encountered During Drilling: Water Level At End of Drilling: Cave Depth At End of Drilling: 7 ft. Water Level After Drilling: Cave Depth After Drilling:	






Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT 1G2109011.GPJ GILES.GDT 10/14/21

<b>BORING NO. &amp; LOCATION:</b> 9	<h1>TEST BORING LOG</h1>	 <b>GILES ENGINEERING ASSOCIATES, INC.</b>	
<b>SURFACE ELEVATION:</b> 802.4 feet			<b>PROPOSED IMPROVEMENTS</b>  311, 402, AND 411 S. CENTER AVENUE JEFFERSON, WISCONSIN  PROJECT NO: 1G-2109011
<b>COMPLETION DATE:</b> 09/27/21			
<b>FIELD REP:</b> KEITH FLOWERS			

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q <sub>i</sub> (tsf)	Q <sub>p</sub> (tsf)	Q <sub>s</sub> (tsf)	W (%)	PID	NOTES
±9" Topsoil Fill: Dark Brown and Brown Sandy Clay, little Organic Matter-Moist			1-SS	3						
Fill: Dark Brown and Brown Sandy Clay, trace Gravel-Moist		800	2-SS	13	7.0	4.5+		17		
Brown Silty Clay, little Sand, trace Gravel-Moist	5		3-SS	18		4.5+		17		
		795	4-SS	38	6.2	4.5+		20		
	10		5-SS	24		3.8		22		

Boring Terminated at about 11 feet (EL. 791.4')

Water Observation Data		Remarks:
	Water Encountered During Drilling:	
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling: 7 ft.	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

## **APPENDIX B**

### **FIELD PROCEDURES**

The field operations were conducted in general accordance with the procedures recommended by the American Society for Testing and Materials (ASTM) designation D

420 entitled "Standard Guide for Sampling Rock and Rock" and/or other relevant specifications. Soil samples were preserved and transported to *Giles'* laboratory in general accordance with the procedures recommended by ASTM designation D 4220 entitled "Standard Practice for Preserving and Transporting Soil Samples." Brief descriptions of the sampling, testing and field procedures commonly performed by *Giles* are provided herein.

## GENERAL FIELD PROCEDURES

### Test Boring Elevations

The ground surface elevations reported on the Test Boring Logs are referenced to the assumed benchmark shown on the Boring Location Plan (Figure 1). Unless otherwise noted, the elevations were determined with a conventional hand-level and are accurate to within about 1 foot.

### Test Boring Locations

The test borings were located on-site based on the existing site features and/or apparent property lines. Dimensions illustrating the approximate boring locations are reported on the Boring Location Plan (Figure 1).

### Water Level Measurement

The water levels reported on the Test Boring Logs represent the depth of “free” water encountered during drilling and/or after the drilling tools were removed from the borehole. Water levels measured within a granular (sand and gravel) soil profile are typically indicative of the water table elevation. It is usually not possible to accurately identify the water table elevation with cohesive (clayey) soils, since the rate of seepage is slow. The water table elevation within cohesive soils must therefore be determined over a period of time with groundwater observation wells.

It must be recognized that the water table may fluctuate seasonally and during periods of heavy precipitation. Depending on the subsurface conditions, water may also become perched above the water table, especially during wet periods.

### Borehole Backfilling Procedures

Each borehole was backfilled upon completion of the field operations. If potential contamination was encountered, and/or if required by state or local regulations, boreholes were backfilled with an “impervious” material (such as bentonite slurry). Borings that penetrated pavements, sidewalks, etc. were “capped” with Portland Cement concrete, asphaltic concrete, or a similar surface material. It must, however, be recognized that the backfill material may settle, and the surface cap may subside, over a period of time. Further backfilling and/or re-surfacing by *Giles’* client or the property owner may be required.



## FIELD SAMPLING AND TESTING PROCEDURES

### Auger Sampling (AU)

Soil samples are removed from the auger flights as an auger is withdrawn above the ground surface. Such samples are used to determine general soil types and identify approximate soil stratifications. Auger samples are highly disturbed and are therefore not typically used for geotechnical strength testing.

### Split-Barrel Sampling (SS) – (ASTM D-1586)

A split-barrel sampler with a 2-inch outside diameter is driven into the subsoil with a 140-pound hammer free-falling a vertical distance of 30 inches. The summation of hammer-blows required to drive the sampler the final 12-inches of an 18-inch sample interval is defined as the “Standard Penetration Resistance” or N-value is an index of the relative density of granular soils and the comparative consistency of cohesive soils. A soil sample is collected from each SPT interval.

### Shelby Tube Sampling (ST) – (ASTM D-1587)

A relatively undisturbed soil sample is collected by hydraulically advancing a thin-walled Shelby Tube sampler into a soil mass. Shelby Tubes have a sharp cutting edge and are commonly 2 to 5 inches in diameter.

### Bulk Sample (BS)

A relatively large volume of soils is collected with a shovel or other manually-operated tool. The sample is typically transported to *Giles’* materials laboratory in a sealed bag or bucket.

### Dynamic Cone Penetration Test (DC) – (ASTM STP 399)

This test is conducted by driving a 1.5-inch-diameter cone into the subsoil using a 15-pound steel ring (hammer), free-falling a vertical distance of 20 inches. The number of hammer-blows required to drive the cone 1¼ inches is an indication of the soil strength and density, and is defined as “N”. The Dynamic Cone Penetration test is commonly conducted in hand auger borings, test pits and within excavated trenches.

- Continued -



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GILES ENGINEERING ASSOCIATES, INC.

### Ring-Lined Barrel Sampling – (ASTM D 3550)

In this procedure, a ring-lined barrel sampler is used to collect soil samples for classification and laboratory testing. This method provides samples that fit directly into laboratory test instruments without additional handling/disturbance.

### Sampling and Testing Procedures

The field testing and sampling operations were conducted in general accordance with the procedures recommended by the American Society for Testing and Materials (ASTM) and/or other relevant specifications. Results of the field testing (i.e. N-values) are reported on the Test Boring Logs. Explanations of the terms and symbols shown on the logs are provided on the appendix enclosure entitled "General Notes".



## **APPENDIX C**

### **LABORATORY TESTING AND CLASSIFICATION**

The laboratory testing was conducted under the supervision of a geotechnical engineer in accordance with the procedures recommended by the American Society for Testing and Materials (ASTM) and/or other relevant specifications. Brief descriptions of laboratory tests commonly performed by *Giles* are provided herein.



## LABORATORY TESTING AND CLASSIFICATION

### Photoionization Detector (PID)

In this procedure, soil samples are “scanned” in *Giles’* analytical laboratory using a Photoionization Detector (PID). The instrument is equipped with an 11.7 eV lamp calibrated to a Benzene Standard and is capable of detecting a minute concentration of **certain** Volatile Organic Compound (VOC) vapors, such as those commonly associated with petroleum products and some solvents. Results of the PID analysis are expressed in HNu (manufacturer’s) units rather than actual concentration.

### Moisture Content (w) (ASTM D 2216)

Moisture content is defined as the ratio of the weight of water contained within a soil sample to the weight of the dry solids within the sample. Moisture content is expressed as a percentage.

### Unconfined Compressive Strength (qu) (ASTM D 2166)

An axial load is applied at a uniform rate to a cylindrical soil sample. The unconfined compressive strength is the maximum stress obtained or the stress when 15% axial strain is reached, whichever occurs first.

### Calibrated Penetrometer Resistance (qp)

The small, cylindrical tip of a hand-held penetrometer is pressed into a soil sample to a prescribed depth to measure the soils capacity to resist penetration. This test is used to evaluate unconfined compressive strength.

### Vane-Shear Strength (qs)

The blades of a vane are inserted into the flat surface of a soil sample and the vane is rotated until failure occurs. The maximum shear resistance measured immediately prior to failure is taken as the vane-shear strength.

### Loss-on-Ignition (ASTM D 2974; Method C)

The Loss-on-Ignition (L.O.I.) test is used to determine the organic content of a soil sample. The procedure is conducted by heating a dry soil sample to 440°C in order to burn-off or “ash” organic matter present within the sample. The L.O.I. value is the ratio of the weight loss due to ignition compared to the initial weight of the dry sample. L.O.I. is expressed as a percentage.



#### Particle Size Distribution (ASTB D 421, D 422, and D 1140)

This test is performed to determine the distribution of specific particle sizes (diameters) within a soil sample. The distribution of coarse-grained soil particles (sand and gravel) is determined from a "sieve analysis," which is conducted by passing the sample through a series of nested sieves. The distribution of fine-grained soil particles (silt and clay) is determined from a "hydrometer analysis" which is based on the sedimentation of particles suspended in water.

#### Consolidation Test (ASTM D 2435)

In this procedure, a series of cumulative vertical loads are applied to a small, laterally confined soil sample. During each load increment, vertical compression (consolidation) of the sample is measured over a period of time. Results of this test are used to estimate settlement and time rate of settlement.

#### Classification of Samples

Each soil sample was visually-manually classified, based on texture and plasticity, in general accordance with the Unified Soil Classification System (ASTM D-2488-75). The classifications are reported on the Test Boring Logs.

#### Laboratory Testing

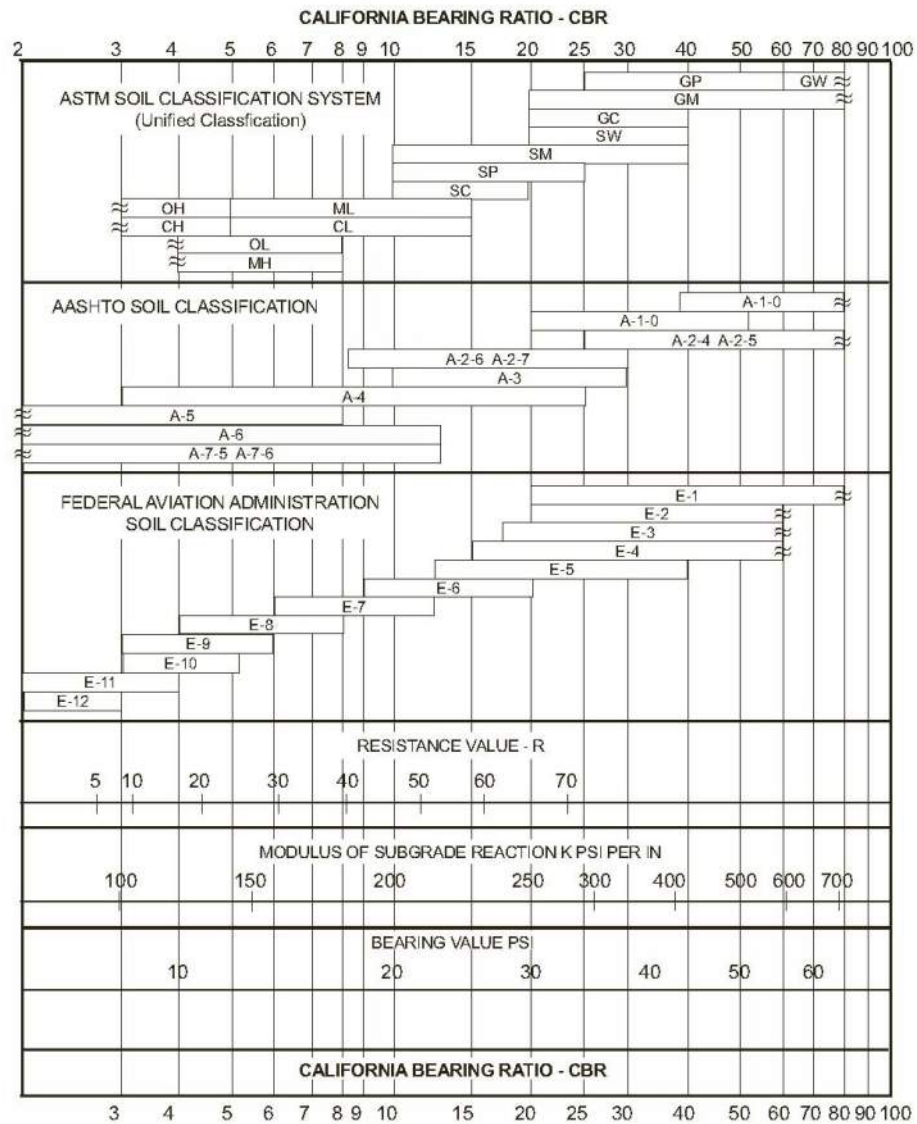
The laboratory testing operations were conducted in general accordance with the procedures recommended by the American Society for Testing and Materials (ASTM) and/or other relevant specifications. Results of the laboratory tests are provided on the Test Boring Logs or other appendix enclosures. Explanation of the terms and symbols used on the logs is provided on the appendix enclosure entitled "General Notes."



## California Bearing Ratio (CBR) Test ASTM D-1833

The CBR test is used for evaluation of a soil subgrade for pavement design. The test consists of measuring the force required for a 3-square-inch cylindrical piston to penetrate 0.1 or 0.2 inch into a compacted soil sample. The result is expressed as a percent of force required to penetrate a standard compacted crushed stone.

Unless a CBR test has been specifically requested by the client, the CBR is estimated from published charts, based on soil classification and strength characteristics. A typical correlation chart is below.



## **APPENDIX D**

### **GENERAL INFORMATION**

#### **AND**

### **IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL REPORT**

## GENERAL COMMENTS

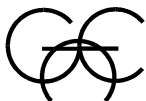
The soil samples obtained during the subsurface exploration will be retained for a period of thirty days. If no instructions are received, they will be disposed of at that time.

This report has been prepared exclusively for the client in order to aid in the evaluation of this property and to assist the architects and engineers in the design and preparation of the project plans and specifications. Copies of this report may be provided to contractor(s), with contract documents, to disclose information relative to this project. The report, however, has not been prepared to serve as the plans and specifications for actual construction without the appropriate interpretation by the project architect, structural engineer, and/or civil engineer. Reproduction and distribution of this report must be authorized by the client and *Giles*.

This report has been based on assumed conditions/characteristics of the proposed development where specific information was not available. It is recommended that the architect, civil engineer and structural engineer along with any other design professionals involved in this project carefully review these assumptions to ensure they are consistent with the actual planned development. When discrepancies exist, they should be brought to our attention to ensure they do not affect the conclusions and recommendations provided herein. The project plans and specifications may also be submitted to *Giles* for review to ensure that the geotechnical related conclusions and recommendations provided herein have been correctly interpreted.

The analysis of this site was based on a subsoil profile interpolated from a limited subsurface exploration. If the actual conditions encountered during construction vary from those indicated by the borings, *Giles* must be contacted immediately to determine if the conditions alter the recommendations contained herein.

The conclusions and recommendations presented in this report have been promulgated in accordance with generally accepted professional engineering practices in the field of geotechnical engineering. No other warranty is either expressed or implied.



**GUIDE SPECIFICATIONS FOR SUBGRADE AND GRADE PREPARATION  
FOR FILL, FOUNDATION, FLOOR SLAB AND PAVEMENT SUPPORT;  
AND SELECTION, PLACEMENT AND COMPACTION OF FILL SOILS  
USING STANDARD PROCTOR PROCEDURES**

1. Construction monitoring and testing of subgrades and grades for fill, foundation, floor slab and pavement; and fill selection, placement and compaction shall be performed by an experienced soils engineer and/or his representatives.
2. All compaction fill, subgrades and grades shall be (a) underlain by suitable bearing material; (b) free of all organic, frozen, or other deleterious material, and (c) observed, tested and approved by qualified engineering personnel representing an experienced soils engineer. Preparation of subgrades after stripping vegetation, organic or other unsuitable materials shall consist of (a) proof-rolling to detect soil, wet yielding soils or other unstable materials that must be undercut, (b) scarifying top 6 to 8 inches, (c) moisture conditioning the soils as required, and (d) recompaction to same minimum in-situ density required for similar materials indicated under Item 5. Note: compaction requirements for pavement subgrade are higher than other areas. Weather and construction equipment may damage compacted fill surface and reworking and retesting may be necessary to assure proper performance.
3. In overexcavation and fill areas, the compacted fill must extend (a) a minimum 1 foot lateral distance beyond the exterior edge of the foundation at bearing grade or pavement subgrade and down to compacted fill subgrade on a maximum 0.5(H):1(V) slope, (b) 1 foot above footing grade outside the building, and (c) to floor subgrade inside the building. Fill shall be placed and compacted on a 5(H):1(V) slope or must be stepped or benched as required to flatten if not specifically approved by qualified personnel under the direction of an experienced soil engineer.
4. The compacted fill materials shall be free of deleterious, organic, or frozen matter, shall contain no chemicals that may result in the material being classified as "contaminated", and shall be low-expansive with a maximum Liquid Limit (ASTM D-423) and Plasticity Index (ASTM D-424) of 30 and 15, respectively, unless specifically tested and found to have low expansive properties and approved by an experienced soils engineer. The top 12 inches of compacted fill should have a maximum 3-inch-particle diameter and all underlying compacted fill a maximum 6-inch-diameter unless specifically approved by an experienced soils engineer. All fill materials must be tested and approved under the direction of an experienced soils engineer prior to placement. If the fill is to provide non-frost susceptible characteristics, it must be classified as a clean GW, GP, SW or SP per the Unified Soil Classification System (ASTM D-2487).
5. For structural fill depths less than 20 feet, the density of the structural compacted fill and scarified subgrade and grades shall not be less than 95 percent of the maximum dry density as determined by Standard Proctor (ASTM-698) with the exception of the top 12 inches of pavement subgrade which shall have a minimum in-situ density of 100 percent of maximum dry density, or 5 percent higher than underlying fill materials. Where the structural fill depth is greater than 20 feet, the portions below 20 feet should have a minimum in-place density of 100 percent of its maximum dry density of 5 percent greater than the top 20 feet. The moisture content of cohesive soil shall not vary by more than -1 to +3 percent and granular soil  $\pm 3$  percent of the optimum when placed and compacted or recompacted, unless specifically recommended/approved by the soils engineer monitoring the placement and compaction. Cohesive soils with moderate to high expansion potentials ( $PI > 15$ ) should, however, be placed, compacted and maintained prior to construction at a moisture content  $3 \pm 1$  percent above optimum moisture content to limit further heave. The fill shall be placed in layers with a maximum loose thickness of 8 inches for foundations and 10 inches for floor slabs and pavement, unless specifically approved by the soils engineer taking into consideration the type of materials and compaction equipment being used. The compaction equipment should consist of suitable mechanical equipment specifically designed for soil compaction. Bulldozers or similar tracked vehicles are typically not suitable for compaction.
6. Excavation, filling, subgrade and grade preparation shall be performed in a manner and sequence that will provide drainage at all times and proper control of erosion. Precipitation, springs and seepage water encountered shall be pumped or drained to provide a suitable working platform. Springs or water seepage encountered during grading/foundation construction must be called to the soil engineer's attention immediately for possible construction procedure revision or inclusion of an underdrain system.
7. Non-structural fill adjacent to structural fill should typically be placed in unison to provide lateral support. Backfill along walls must be placed and compacted with care to ensure excessive unbalanced lateral pressures do not develop. The type of fill material placed adjacent to below-grade walls (i.e. basement walls and retaining walls) must be properly tested and approved by an experienced soils engineer with consideration for the lateral pressure used in the wall design.
8. Whenever, in the opinion of the soils engineer or the Owner's Representatives, an unstable condition is being created either by cutting or filling, the work shall not proceed into that area until an appropriate geotechnical exploration and analysis has been performed and the grading plan revised, if found necessary.



CHARACTERISTICS AND RATINGS OF UNIFIED SOIL SYSTEM CLASSES FOR SOIL CONSTRUCTION *									
Class	Compaction Characteristics	Max. Dry Density Standard Proctor (pcf)	Compressibility and Expansion	Drainage and Permeability	Value as an Embankment Material	Value as Subgrade When Not Subject to Frost	Value as Base Course	Value as Temporary Pavement	
								With Dust Palliative	With Bituminous Treatment
GW	Good: tractor, rubber-tired, steel wheel or vibratory roller	125-135	Almost none	Good drainage, pervious	Very stable	Excellent	Good	Fair to poor	Excellent
GP	Good: tractor, rubber-tired, steel wheel or vibratory roller	115-125	Almost none	Good drainage, pervious	Reasonably stable	Excellent to good	Poor to fair	Poor	
GM	Good: rubber-tired or light sheepsfoot roller	120-135	Slight	Poor drainage, semipervious	Reasonably stable	Excellent to good	Fair to poor	Poor	Poor to fair
GC	Good to fair: rubber-tired or sheepsfoot roller	115-130	Slight	Poor drainage, impervious	Reasonably stable	Good	Good to fair **	Excellent	Excellent
SW	Good: tractor, rubber-tired or vibratory roller	110-130	Almost none	Good drainage, pervious	Very stable	Good	Fair to poor	Fair to poor	Good
SP	Good: tractor, rubber-tired or vibratory roller	100-120	Almost none	Good drainage, pervious	Reasonably stable when dense	Good to fair	Poor	Poor	Poor to fair
SM	Good: rubber-tired or sheepsfoot roller	110-125	Slight	Poor drainage, impervious	Reasonably stable when dense	Good to fair	Poor	Poor	Poor to fair
SC	Good to fair: rubber-tired or sheepsfoot roller	105-125	Slight to medium	Poor drainage, impervious	Reasonably stable	Good to fair	Fair to poor	Excellent	Excellent
ML	Good to poor: rubber-tired or sheepsfoot roller	95-120	Slight to medium	Poor drainage, impervious	Poor stability, high density required	Fair to poor	Not suitable	Poor	Poor
CL	Good to fair: sheepsfoot or rubber-tired roller	95-120	Medium	No drainage, impervious	Good stability	Fair to poor	Not suitable	Poor	Poor
OL	Fair to poor: sheepsfoot or rubber-tired roller	80-100	Medium to high	Poor drainage, impervious	Unstable, should not be used	Poor	Not suitable	Not suitable	Not suitable
MH	Fair to poor: sheepsfoot or rubber-tired roller	70-95	High	Poor drainage, impervious	Poor stability, should not be used	Poor	Not suitable	Very poor	Not suitable
CH	Fair to poor: sheepsfoot roller	80-105	Very high	No drainage, impervious	Fair stability, may soften on expansion	Poor to very poor	Not suitable	Very poor	Not suitable
OH	Fair to poor: sheepsfoot roller	65-100	High	No drainage, impervious	Unstable, should not be used	Very poor	Not suitable	Not suitable	Not suitable
Pt	Not suitable		Very high	Fair to poor drainage	Should not be used	Not suitable	Not suitable	Not suitable	Not suitable

\* "The Unified Classification: Appendix A - Characteristics of Soil, Groups Pertaining to Roads and Airfields, and Appendix B - Characteristics of Soil Groups Pertaining to Embankments and Foundations," Technical Memorandum 357, U.S. Waterways Experiment Station, Vicksburg, 1953.

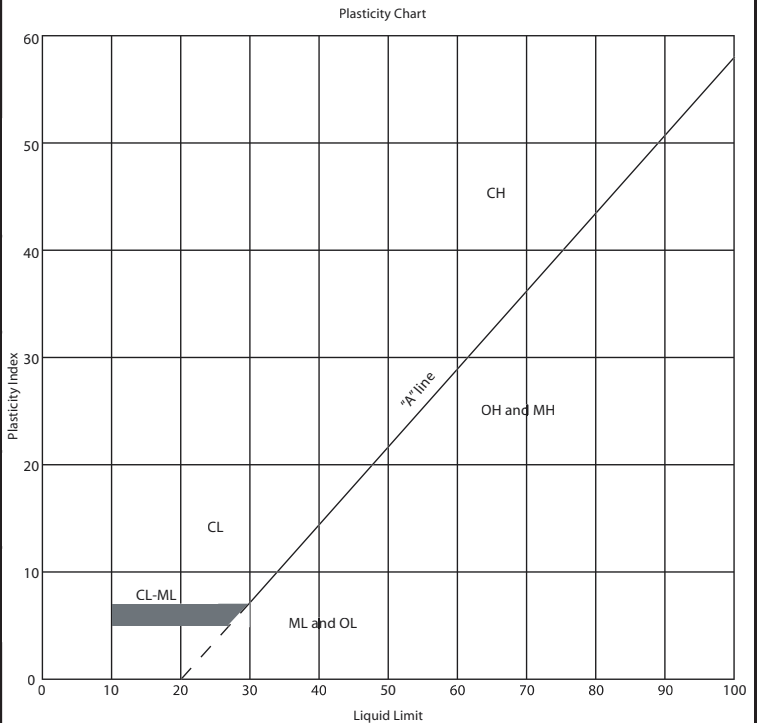
\*\* Not suitable if subject to frost.



# UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

Major Divisions		Group Symbols	Typical Names	Laboratory Classification Criteria	
Coarse-grained soils (more than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW
		Gravels with fines (appreciable amount of fines)	GM <sup>a</sup> d	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4  Limits plotting within shaded area, above "A" line with P.I. between 4 and 7 are <i>borderline</i> cases requiring use of dual symbols
			GM <sup>a</sup> u		
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits above "A" line or P.I. greater than 7
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM <sup>a</sup> d	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4  Limits plotting within shaded area, above "A" line with P.I. between 4 and 7 are <i>borderline</i> cases requiring use of dual symbols
			SM <sup>a</sup> u		
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line or P.I. greater than 7
Fine-grained soils (More than half material is smaller than No. 200 sieve size)	Silt and clays (Liquid limit less than 50)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity		
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays		
		OL	Organic silts and organic silty clays of low plasticity		
	Silt and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
		CH	Inorganic clays of high plasticity, fat clays		
		OH	Organic clays of medium to high plasticity, organic silts		
	Highly organic soils	Pt	Peat and other highly organic soils		

Determine percentages of sand and gravel from grain-size curve.  
Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:  
Less than 5 percent: GW, GP, SW, SP  
More than 12 percent: GM, GC, SM, SC  
5 to 12 percent: *Borderline* cases requiring dual symbols<sup>b</sup>



<sup>a</sup> Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits, suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u is used when L.L. is greater than 28.

<sup>b</sup> Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example GW-GC, well-graded gravel-sand mixture with clay binder.



## GENERAL NOTES

### SAMPLE IDENTIFICATION

All samples are visually classified in general accordance with the Unified Soil Classification System (ASTM D-2487-75 or D-2488-75)

### DESCRIPTIVE TERM (% BY DRY WEIGHT)

Trace:	1-10%
Little:	11-20%
Some:	21-35%
And/Adjective	36-50%

### PARTICLE SIZE (DIAMETER)

Boulders:	8 inch and larger
Cobbles:	3 inch to 8 inch
Gravel:	coarse - $\frac{3}{4}$ to 3 inch fine - No. 4 (4.76 mm) to $\frac{3}{4}$ inch
Sand:	coarse - No. 4 (4.76 mm) to No. 10 (2.0 mm) medium - No. 10 (2.0 mm) to No. 40 (0.42 mm) fine - No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt:	No. 200 (0.074 mm) and smaller (non-plastic)
Clay:	No 200 (0.074 mm) and smaller (plastic)

### SOIL PROPERTY SYMBOLS

Dd:	Dry Density (pcf)
LL:	Liquid Limit, percent
PL:	Plastic Limit, percent
PI:	Plasticity Index (LL-PL)
LOI:	Loss on Ignition, percent
Gs:	Specific Gravity
K:	Coefficient of Permeability
w:	Moisture content, percent
qp:	Calibrated Penetrometer Resistance, tsf
qs:	Vane-Shear Strength, tsf
qu:	Unconfined Compressive Strength, tsf
qc:	Static Cone Penetrometer Resistance (correlated to Unconfined Compressive Strength, tsf)
PID:	Results of vapor analysis conducted on representative samples utilizing a Photoionization Detector calibrated to a benzene standard. Results expressed in HNU-Units. (BDL=Below Detection Limit)
N:	Penetration Resistance per 12 inch interval, or fraction thereof, for a standard 2 inch O.D. (1 $\frac{1}{8}$ inch I.D.) split spoon sampler driven with a 140 pound weight free-falling 30 inches. Performed in general accordance with Standard Penetration Test Specifications (ASTM D-1586). N in blows per foot equals sum of N-Values where plus sign (+) is shown.
Nc:	Penetration Resistance per 1 $\frac{3}{4}$ inches of Dynamic Cone Penetrometer. Approximately equivalent to Standard Penetration Test N-Value in blows per foot.
Nr:	Penetration Resistance per 12 inch interval, or fraction thereof, for California Ring Sampler driven with a 140 pound weight free-falling 30 inches per ASTM D-3550. Not equivalent to Standard Penetration Test N-Value.

### DRILLING AND SAMPLING SYMBOLS

SS:	Split-Spoon
ST:	Shelby Tube - 3 inch O.D. (except where noted)
CS:	3 inch O.D. California Ring Sampler
DC:	Dynamic Cone Penetrometer per ASTM Special Technical Publication No. 399
AU:	Auger Sample
DB:	Diamond Bit
CB:	Carbide Bit
WS:	Wash Sample
RB:	Rock-Roller Bit
BS:	Bulk Sample
Note:	Depth intervals for sampling shown on Record of Subsurface Exploration are not indicative of sample recovery, but position where sampling initiated

## SOIL STRENGTH CHARACTERISTICS

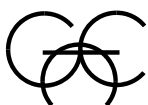
### COHESIVE (CLAYEY) SOILS

COMPARATIVE CONSISTENCY	BLOWS PER FOOT (N)	UNCONFINED COMPRESSIVE STRENGTH (TSF)
Very Soft	0 - 2	0 - 0.25
Soft	3 - 4	0.25 - 0.50
Medium Stiff	5 - 8	0.50 - 1.00
Stiff	9 - 15	1.00 - 2.00
Very Stiff	16 - 30	2.00 - 4.00
Hard	31+	4.00+

### NON-COHESIVE (GRANULAR) SOILS

RELATIVE DENSITY	BLOWS PER FOOT (N)
Very Loose	0 - 4
Loose	5 - 10
Firm	11 - 30
Dense	31 - 50
Very Dense	51+

DEGREE OF PLASTICITY	PI	DEGREE OF EXPANSIVE POTENTIAL	PI
None to Slight	0 - 4	Low	0 - 15
Slight	5 - 10	Medium	15 - 25
Medium	11 - 30	High	25+
High to Very High	31+		



# Important Information about This Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

**The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.**

## Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

## Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer

will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

*Do not rely on this report if your geotechnical engineer prepared it:*

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.*

## Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

## You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

### Most of the “Findings” Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site’s subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual site-wide subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

### This Report’s Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

### This Report Could Be Misinterpreted

Other design professionals’ misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals’ plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

### Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note*

*conspicuously that you’ve included the material for information purposes only.* To avoid misunderstanding, you may also want to note that “informational purposes” means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

### Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled “limitations,” many of these provisions indicate where geotechnical engineers’ responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

### Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a “phase-one” or “phase-two” environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

### Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer’s services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, *proper implementation of the geotechnical engineer’s recommendations will not of itself be sufficient to prevent moisture infiltration.* Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. *Geotechnical engineers are not building-envelope or mold specialists.*



GEOPROFESSIONAL  
BUSINESS  
ASSOCIATION

Telephone: 301/565-2733

e-mail: [info@geoprofessional.org](mailto:info@geoprofessional.org) [www.geoprofessional.org](http://www.geoprofessional.org)



# BID FORM

PROJECT: JEFFERSON COUNTY COURTHOUSE AND SHERIFF BUILDING  
RENOVATIONS AND ADDITIONS  
311 S. CENTER AVENUE  
JEFFERSON, WISCONSIN 53549

TO: JEFFERSON COUNTY  
311 S CENTER AVENUE, ROOM 111  
JEFFERSON, WISCONSIN 53549

I (We) \_\_\_\_\_  
 (A Corporation) (A Partnership) (An Individual)  
 Strike out those that do not apply

Of \_\_\_\_\_  
 Street City State Zip

Telephone Number	E-mail Address
------------------	----------------

a Bona Fide Prime Bidder, have received the Procurement Documents which include the Project Manual and Drawings (as indexed on Drawing CD01), prepared by Potter Lawson, Inc., dated July 22, 2022 for the above referenced project. I (We) have also received Addenda Nos. \_\_\_\_\_, and have included their provisions in this Bid.

I (We) have examined the Procurement Documents noted above including all referenced AIA Documents, and agree to enter into and execute a Contract, if awarded, on the basis of this Bid, and to furnish guarantee bonds in accord with Article 11 of the General Conditions of the Contract for Construction.

### BASE BID for a MULTIPLE BID CATEGORY CONTRACT

I (We) will perform all the Work of **(Combined) (Individual) Bid Category** \_\_\_\_\_ except for Work described as additive in Alternatives, for the stipulated sum of \_\_\_\_\_

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

## ALTERNATIVE BIDS

Alternative Bids are more fully described in Section 01 23 00 of the Specifications. All Prime Bidders must indicate the stipulated sum to be added to or deducted from their Base Bid or indicate "no change". A "no bid" entry, or failure to enter a sum will be considered a "no change" to the Base Bid.

## **PERFORMANCE AND PAYMENT BOND**

If the Owner elects not to require that I (We) provide a Performance/Labor and Materials Bond, deduct from my (our) Base Bid the stipulated lump sum of \_\_\_\_\_

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

**ALTERNATIVE BID NO. 1 – Green Roof and Roof Pavers**

If the Owner elects to accept this alternative, add to my (our) Base Bid the stipulated sum of

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

**ALTERNATIVE BID NO. 2 - Skylights**

If the Owner elects to accept this alternative, add to my (our) Base Bid the stipulated sum of

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

**ALLOWANCES** (Refer to Section 01 21 00 of the Specifications)

I (We) have included all allowances as stated in the Contract Documents.

**UNIT PRICES**

Bidders shall provide the following unit prices. These unit prices will be used to adjust the Contract Sum if more or less is required than that shown on the Contract Documents.

No. 1: Unsatisfactory Soil Replacement with Fill \$ \_\_\_\_\_ /cy

No. 2: Unsatisfactory Soile Replacement with Lean Mix Concrete \$ \_\_\_\_\_ /cy

No. 3: Cutting and Patching Slab-on-Grade \$ \_\_\_\_\_ /sf

No. 4: EIFS Repair and Infill \$ \_\_\_\_\_ /sf

No. 5: Plaster Patching \$ \_\_\_\_\_ /sf

No. 6: Chase Enclosure System \$ \_\_\_\_\_ /lf

**SUBCONTRACTOR LIST**

I (We) understand that after Bid opening, to be considered for contract Award, I (we) must submit a list of Major Subcontractors in accordance with the Instructions to Bidders.

**SUBSTANTIAL COMPLETION**

The date of Substantial Completion is indicated in the Instructions to Bidders, and if awarded the Contract within 45 days after receipt of the Bid I (We) will substantially complete the Work of Base Bid and accepted Alternative Bids on or before

\_\_\_\_\_.  
(Insert Date)

**WISCONSIN SALES/USE TAXES**

Except for sales and use tax exempted by law, I (We) have included all Wisconsin Sales/Use Taxes applicable to this Project in accordance with current Wisconsin Statutes and regulations of the Wisconsin Department of Revenue.

**BID SECURITY**

I (We) have attached the required Bid Security to this Bid.

**SIGNATURE**

\_\_\_\_\_  
Firm Name

\_\_\_\_\_  
WI Registered Building Contractor Number

By (Signature)

Printed Name and Title

Attested

\_\_\_\_\_  
(Authorized Corporate Officer)

Dated \_\_\_\_\_, 2022

(Affix Corporate Seal Here)

End of Bid Form

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# **CONTRACTING REQUIREMENTS**



## **SECTION 00 60 00 - PROJECT FORMS**

### **PART 1 - GENERAL**

#### **1.1 FORM OF AGREEMENT AND GENERAL CONDITIONS**

- A. The Agreement Form Between the County and Contractors is not bound in this Project Manual.
- B. The Agreement Form may be obtained from the Construction Manager, Maas Brothers Construction Company, upon request.
- C. The following form of Owner/Contractor Agreement and form of the General Conditions shall be used for Project:
  - 1. The General Conditions are included in the Project Manual following this Section.
  - 2. The Supplementary Conditions for Project are separately prepared and included in the Project Manual.

#### **1.2 ADMINISTRATIVE FORMS**

- A. Administrative Forms: Additional administrative forms are specified in Division 01 General Requirements.
- B. Copies of AIA standard forms may be obtained from the American Institute of Architects; [www.aiacontractdocs.org](http://www.aiacontractdocs.org); (800) 942-7732.
- C. Preconstruction Forms:
  - 1. Form of Performance Bond and Labor and Material Bond: AIA Document A312-2010 "Performance Bond and Payment Bond."
  - 2. Form of Certificate of Insurance: AIA Document G715-2017 "Supplemental Attachment for ACORD Certificate of Insurance 25."
- D. Information and Modification Forms:
  - 1. Change Order Form: AIA Document G701-2017 "Change Order."
  - 2. Form of Change Directive: AIA Document G714-2017 "Construction Change Directive."
- E. Payment Forms:
  - 1. Schedule of Values Form: AIA Document G703-1992 "Continuation Sheet."
  - 2. Payment Application: AIA Document G702-1992/703-1992 "Application and Certificate for Payment and Continuation Sheet."
  - 3. Form of Contractor's Affidavit: AIA Document G706-1994 "Contractor's Affidavit of Payment of Debts and Claims."
  - 4. Form of Affidavit of Release of Liens: AIA Document G706A-1994 "Contractor's Affidavit of Payment of Release of Liens."
  - 5. Form of Consent of Surety: AIA Document G707-1994 "Consent of Surety to Final Payment."

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

END OF SECTION

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# DRAFT AIA® Document A401™ – 2017

## Standard Form of Agreement Between Contractor and Subcontractor

**AGREEMENT** made as of the « » day of « » in the year « »  
(In words, indicate day, month and year.)

**BETWEEN** the Contractor:  
(Name, legal status, address and other information)

« Maas Bros. Construction Co., »« Inc. »  
« 410 Water Tower Court »  
« Watertown, WI 53094 »  
« »

and the Subcontractor:  
(Name, legal status, address and other information)

« »« »  
« »  
« »  
« »

The Contractor has made a contract for construction (hereinafter, the Prime Contract)  
dated: « March 8, 2022 »

with the Owner:  
(Name, legal status, address and other information)

« Jefferson County »« »  
« 311 South Center Avenue »  
« Jefferson, WI 53549 »  
« »

for the following Project:  
(Name, location and detailed description)

« Jefferson County – Courthouse/Sheriff's Building Renovation and Additions »  
« 311 South Center Ave, Jefferson, WI 53549 »  
« »

The Prime Contract provides for the furnishing of labor, materials, equipment and services in connection with the construction of the Project. A copy of the Prime Contract, consisting of the Agreement Between Owner and Contractor (from which compensation amounts may be deleted) and the other Contract Documents enumerated therein, has been made available to the Subcontractor.

The Architect for the Project:  
(Name, legal status, address and other information)

« Potter Lawson, »« Inc. »  
« 749 University Row, Suite 300 »  
« Madison, WI 53705 »

**ADDITIONS AND DELETIONS:**  
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

AIA Document A201™-2017, General Conditions of the Contract for Construction, is adopted in this document by reference.

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The Contractor and the Subcontractor agree as follows.



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2	MUTUAL RIGHTS AND RESPONSIBILITIES
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15	ENUMERATION OF SUBCONTRACT DOCUMENTS

### ARTICLE 1 THE SUBCONTRACT DOCUMENTS

§ 1.1 The Subcontract Documents consist of (1) this Agreement; (2) the Prime Contract, consisting of the Agreement between the Owner and Contractor and the other Contract Documents enumerated therein; (3) Modifications to the Prime Contract, whether issued before or after the execution of this Agreement, in accordance with the provisions of Article 5; (4) other documents listed in Article 15 of this Agreement; and (5) Modifications to this Subcontract issued after execution of this Agreement, in accordance with the provisions of Article 5. These form the Subcontract, and are as fully a part of the Subcontract as if attached to this Agreement or repeated herein.

§ 1.2 The Subcontract Documents form the Subcontract for Construction. The Subcontract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Subcontract Documents, other than Modifications to the Prime Contract or Modifications to this Subcontract issued subsequent to the execution of this Agreement, appears in Article 15.

§ 1.3 The Subcontract may be amended or modified only by a Modification to this Subcontract. A Modification to this Subcontract is a written amendment to this Agreement signed by both parties, or as otherwise described in, and in accordance with the provisions of, Article 5.

§ 1.4 The Subcontract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and the Subcontractor, (2) between the Owner and the Subcontractor, or (3) between any persons or entities other than the Contractor and Subcontractor.

§ 1.5 The Contractor shall make the Subcontract Documents available to the Subcontractor prior to execution of this Agreement, and thereafter, upon request. The Contractor may charge the Subcontractor for the reasonable cost to reproduce the Subcontract Documents provided to the Subcontractor. The Subcontractor, by signing this Agreement, acknowledges that it has independently assured itself that the Prime Contract has been made available to it and

confirms that it has had the opportunity to examine all documents comprising the Prime Contract. The Contractor, in its sole discretion, may withhold any portion of the Prime Contract which contains proprietary and/or pricing information.

## **ARTICLE 2 MUTUAL RIGHTS AND RESPONSIBILITIES**

The Subcontractor shall assume toward the Contractor all obligations and responsibilities that the Contractor, under the Prime Contract, assumes toward the Owner with respect to the Work, unless more stringent requirement in the performance of the Work is provided in this Agreement, in which case this Agreement shall control. The Contractor shall have the benefit of all rights, remedies, and redress against the Subcontractor that the Owner, under the Prime Contract, has against the Contractor insofar as applicable to this Subcontract. Where a provision of such documents is inconsistent with a provision of this Agreement, this Agreement shall govern.

## **ARTICLE 3 CONTRACTOR**

### **§ 3.1 General**

**§ 3.1.1** The Contractor is the person or entity identified as such in this Agreement and is referred to throughout the Subcontract Documents as if singular in number. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all Project matters requiring the Contractor's approval or authorization. The term "Contractor" means the Contractor or the Contractor's authorized representative.

**§ 3.1.2** The Contractor shall render decisions in a timely manner and in accordance with the Contractor's construction schedule.

### **§ 3.2 Services Provided by the Contractor**

**§ 3.2.1** The Contractor shall cooperate with the Subcontractor, subject to Section 4.2, in scheduling and performing the Contractor's Work to avoid conflicts or interference in the Subcontractor's Work and shall review, and expedite written responses to, submittals made by the Subcontractor in accordance with Section 4.2. and Article 5. The Contractor shall provide the Subcontractor with copies of the Contractor's construction schedule and schedule of submittals. The Contractor shall promptly notify the Subcontractor of subsequent changes in the construction and submittal schedules. The Subcontractor shall perform the Work in accordance with such schedules and revisions thereto.

**§ 3.2.2** The Contractor shall provide suitable areas for storage of the Subcontractor's materials and equipment during the course of the Work.

### **§ 3.3 Communications**

**§ 3.3.1** The Contractor shall make available to the Subcontractor information received from the Owner that affects the performance of this Subcontract and that becomes available to the Contractor subsequent to execution of this Subcontract.

**§ 3.3.2** The Contractor shall not give instructions or orders directly to the Subcontractor's employees or to the Subcontractor's Sub-subcontractors or suppliers unless such persons are authorized representatives of the Subcontractor.

**§ 3.3.3** If hazardous materials or substances are being used on the site by the Contractor, a subcontractor, or anyone directly or indirectly employed by them (other than the Subcontractor), and they are a type of hazardous material or substance of which an employer is required by law to notify its employees, the Contractor shall, prior to delivery to the Project site or exposure of the Subcontractor's employees to such material or substance, give notice of the chemical composition thereof to the Subcontractor in sufficient detail and time to permit the Subcontractor's compliance with such laws.

**§ 3.3.4** The Contractor shall promptly notify the Subcontractor of any fault or defect in the Work under this Subcontract or nonconformity with the Subcontract Documents.

### **§ 3.4 Claims by the Contractor**

**§ 3.4.1** Liquidated damages, or any other delay damages for which Contractor is liable to the Owner, if provided for in this Agreement or the Prime Contract, shall be assessed against the Subcontractor to the extent attributable or caused by the Subcontractor or any person or entity for whose acts the Subcontractor may be liable.



### § 3.5 Contractor's Remedies

§ 3.5.1 If the Subcontractor defaults or neglects to carry out the Work in accordance with this Agreement and fails within three (3) days after receipt of written notice from the Contractor to commence and continue correction of such default or neglect with diligence and promptness, the Contractor may, by appropriate Modification, and without prejudice to other remedies the Contractor may have, make good such deficiencies and/or terminate this Subcontract for cause and finish the Work by such means as the Contractor sees fit. The Contractor may deduct the reasonable cost of curing the default, or completing the Work, and any other damages caused thereby, from the payments then or thereafter due the Subcontractor. If the cost to cure the default, complete the Work and/or offset other damages caused thereby exceeds the unpaid balance, then the Subcontractor shall immediately pay the difference to the Contractor.

§ 3.5.2 If reasonable grounds exist indicating the Subcontractor will be in breach of the Subcontract and the Subcontractor fails to give the Contractor evidence satisfactory to the Contractor that the Subcontractor will be able to perform and/or otherwise fulfill its obligations under the Subcontract within three (3) days' notice of the Contractor's demand for such assurances, failure to deliver such assurance shall constitute a default entitling the Contractor to the remedies set forth in this Subcontract.

## ARTICLE 4 SUBCONTRACTOR

### § 4.1 General

The Subcontractor is the person or entity identified as such in this Agreement and is referred to throughout the Subcontract Documents as if singular in number. The Subcontractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Subcontractor shall designate in writing a representative who shall have express authority to act on the Subcontractor's behalf with respect to the Project. The term "Subcontractor" means the Subcontractor or the Subcontractor's authorized representative.

### § 4.2 Execution and Progress of the Work

§ 4.2.1 For all Work the Subcontractor intends to subcontract, the Subcontractor shall enter into written agreements with Sub-subcontractors performing portions of the Work. Any written agreement between the Subcontractor and the Sub-subcontractor shall require that; (i) the Sub-subcontractor be bound to the Subcontractor to the same extent the Subcontractor is bound to the Contractor under this Agreement with respect to the work performed by the Sub-subcontractor under the subcontract (e.g. requirements of the Prime Contract and this Agreement with respect to the work of the Sub-subcontractor are incorporated into the subcontract between the Subcontract and the Sub-subcontractor), (ii) Sub-subcontractor and Subcontractor assume toward the other all obligations and responsibilities that the Contractor and Subcontractor assume toward each other and, Sub-subcontractor and Subcontractor have the benefit of all rights, remedies and redress each against the other that the Contractor and Subcontractor have by virtue of the provisions of this Agreement.

§ 4.2.2 The Subcontractor shall supervise and direct the Subcontractor's Work to avoid conflict, delay in, or interference with the Work of the Contractor, other subcontractors, the Owner, or Separate Contractors. The Subcontractor is responsible for the acts, omissions and performance of any portion of the Work by any sub-subcontractor, material supplier, laborer or other consultant of the Subcontractor of any tier ("Sub-subcontractor").

### § 4.2.3 Submittals

§ 4.2.3.1 The Subcontractor shall submit Shop Drawings, Product Data, Samples, and similar submittals required by the Subcontract Documents or otherwise as requested by the Contractor with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Contractor or other subcontractors.

§ 4.2.3.2 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Subcontractor represents to the Contractor that the Subcontractor has (1) reviewed and approved them; (2) determined and verified materials, field measurements, and field construction criteria related thereto, or will do so; and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Subcontract Documents.

§ 4.2.4 The Subcontractor shall furnish to the Contractor periodic progress reports on the Work of this Subcontract as required by the Contractor, including information on the status of materials and equipment that may be in the course of preparation, manufacture, or transit.

§ 4.2.5 The Subcontractor agrees that the Contractor and the Architect each have the authority to reject Work of the Subcontractor that does not conform to the Prime Contract or the Subcontract Documents. The Architect's decisions on matters relating to aesthetic effect shall be final and binding on the Subcontractor if consistent with the intent expressed in the Prime Contract.

§ 4.2.6 The Subcontractor shall pay for all materials, equipment, and labor used in connection with the performance of this Subcontract, and shall furnish satisfactory evidence, when requested by the Contractor, to verify compliance with the above requirements, including, but not limited to, lien waivers.

§ 4.2.7 The Subcontractor shall take necessary precautions to properly protect the work of the Contractor, Separate Contractors, and other subcontractors from damage caused by operations under this Subcontract.

§ 4.2.8 The Subcontractor shall cooperate with the Contractor, other subcontractors, the Owner, and Separate Contractors whose work might affect the Subcontractor's Work and shall promptly notify the Contractor of any such interference. The Subcontractor shall participate in the preparation of coordinated drawings in areas of congestion, if required by the Contractor or Prime Contract, specifically noting and advising the Contractor of potential conflicts between the Work of the Subcontractor and that of the Contractor, other subcontractors, the Owner, or Separate Contractors.

§ 4.2.9 By executing this Agreement, the Subcontractor represents and warrants that it has made a thorough examination of the Project Site, it is aware of the physical conditions of the Project Site as well as local available labor, weather, transportation, utilities, and storage conditions, and it has located and allowed for all conditions, including concealed or subsurface conditions that may be encountered in the performance of the Work. The Subcontractor further represents and warrants that it has not relied upon any representations made or implied by the Contractor regarding conditions at or affecting the Project Site. The Subcontractor has taken all such conditions into account in arriving at the Subcontract Price. No additional compensation or extension of time shall be allowed because of physical, subsurface, concealed, abnormal, unknown, unforeseen or other conditions at or affecting the Project Site.

#### § 4.3 Permits, Fees, Notices, and Compliance with Laws

§ 4.3.1 The Subcontractor shall give notices and comply with applicable laws, statutes, ordinances, codes, rules and regulations, permits and lawful orders of public authorities bearing on performance of the Work of this Subcontract. The Subcontractor shall secure and pay for permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Subcontractor's Work. The Subcontractor represents and warrants that it holds all licenses and approvals required to perform the Work, including municipal and state licenses and contractor registration.

§ 4.3.2 The Subcontractor shall comply with all codes, permits, rules, regulations, laws and ordinances, including those relating to safety, taxes, social security, unemployment compensation, workers' compensation and the environment, applicable to the Work or the Project ("Laws" or "laws").

#### § 4.4 Safety Precautions and Procedures

§ 4.4.1 The Subcontractor shall take appropriate safety precautions with respect to performance of this Subcontract. The Subcontractor shall comply with safety measures initiated by the Contractor and the Owner and comply with applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, for the safety of persons and property, in accordance with the requirements of the Prime Contract. The Subcontractor shall notify the Contractor within one (1) day of an injury to an employee or agent of the Subcontractor or property damage which occurred at the site. The Subcontractor shall remedy any damages to the Work or damages to other property caused by or arising from the Work.

§ 4.4.2 If hazardous materials or substances are being used on the site by the Subcontractor, the Subcontractor's Sub-subcontractors, or anyone directly or indirectly employed by them, and they are a type of hazardous material or substance of which an employer is required by law to notify its employees, the Subcontractor shall, prior to delivery to the Project site or exposure of the Contractor, other subcontractors, and other employers on the site to such material or substance, give notice of the chemical composition thereof to the Contractor in sufficient detail and time to permit compliance with the laws by the Contractor, other subcontractors, and other employers on the site.

§ 4.4.3 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a hazardous material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Subcontractor, the Subcontractor shall, upon recognizing the condition, immediately stop Work in the affected area and promptly report the condition to the Contractor in writing. When the material or substance has been rendered harmless, the Subcontractor's Work in the affected area shall resume upon written agreement of the Contractor and Subcontractor. The Subcontract Time shall be extended appropriately, and the Subcontract Sum shall be increased in the amount of the Subcontractor's reasonable additional costs of demobilization, delay, and remobilization, which adjustments shall be accomplished as provided in Article 5 of this Agreement.

§ 4.4.4 The Subcontractor shall reimburse the Contractor for the cost and expense the Contractor incurs (1) for remediation of a hazardous material or substance brought to the site and negligently handled by the Subcontractor or (2) where the Subcontractor fails to perform its obligations under Section 4.4.3, except to the extent that the cost and expense are due to the Contractor's fault or negligence.

§ 4.4.5 The Subcontractor shall be solely responsible for the protection, safety, and occupational health of its and its subcontractor's employees, including, but not limited to, maintaining safety equipment, implementing safe work practices, completed required reports and records, inspecting work areas and employee safety equipment, providing necessary personal protective equipment, and instructing its and its subcontractor's employees on all safety and health standards applicable to its work.

§ 4.4.6 The Subcontractor shall provide a properly trained "competent person" as defined by the Occupational Safety & Health Administration (OSHA), whose responsibilities shall be the prevention of accidents. Such competent person shall be the Subcontractor's superintendents or foreman unless the Subcontractor notified the Contractor otherwise, and that person shall be on the Project Site during the performance of the Subcontract Work as required by OSHA regulations.

§ 4.4.7 Training on equipment or related to specific work tasks of the Subcontractor's employees, as required by OSHA, must be documented and made available upon request.

§ 4.4.8 The Subcontractor's responsibilities and indemnifications obligations to the Contractor apply without exception to all claims arising out of or in connection with the Subcontractor's responsibilities under this Article, regardless of whether the Contractor assisted or advised the Subcontractor in fulfilling such responsibilities. The Contractor reserves the right to stop any part of the Work which the Contractor deems unsafe until corrective measures have been taken. Corrective measures initiated by the Contractor do not absolve the Subcontractor of responsibility and costs incurred.

## § 4.5 Cleaning Up

§ 4.5.1 The Subcontractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations performed under this Subcontract. The Subcontractor shall not be held responsible for conditions caused by other contractors or subcontractors. The Subcontractor shall be responsible for the containment and legal disposal of debris resulting from the Subcontract Work from the Worksite as necessary or as directed by the Contractor. In the event the Subcontractor utilizes dumpsters supplied to the Worksite by the Contractor, the Contractor may charge the Subcontractor for the Subcontractor's proportionate share of the dumpster use.

§ 4.5.2 If the Subcontractor fails to clean up as provided in the Subcontract Documents, the Contractor may, after forty-eight (48) hours' notice to the Subcontractor, charge the Subcontractor for the Subcontractor's appropriate share of cleanup costs.

## § 4.6 Warranty

§ 4.6.1 The Subcontractor warrants to the Owner, Architect, and Contractor that materials and equipment furnished under this Subcontract will be of good quality and new unless the Subcontract Documents require or permit otherwise. The Subcontractor further warrants that the Work will conform to the requirements of the Subcontract Documents and will be free from defects, except for those inherent in the quality of the Work the Subcontract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Subcontractor will guarantee the Work for longer of the warranty time period prescribed in the Prime Contract or one (1) year after final completion of the Project and acceptance of all work by the Owner.

The Subcontractor shall repair and/or replace, at the Contractor's sole option, any defective Work and any damages caused thereby promptly upon notice from the Contractor. Said warranty period will be extended for one (1) year from the date of any repair or replacement of the Work within the warranty period. The Subcontractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Subcontractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect and Contractor, the Subcontractor shall provide satisfactory evidence as to the kind and quality of materials and equipment furnished or to be furnished.

**§ 4.6.2** All material, equipment, or other special warranties required by the Subcontract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with the Subcontract Documents.

#### **§ 4.7 Indemnification**

**§ 4.7.1** To the fullest extent permitted by law, the Subcontractor shall defend, indemnify and hold harmless the Owner, Contractor, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorney's fees, arising out of or resulting from performance of the Subcontractor's Work under this Subcontract (collectively, a "Claim") but only to the extent caused by the Subcontractor's breach of a term or condition of the Subcontract Documents or by the negligent acts or omissions of the Subcontractor, the Subcontractor's Sub-subcontractors, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 4.7.

**§ 4.7.2** In claims against any person or entity indemnified under this Section 4.7 by an employee of the Subcontractor, the Subcontractor's Sub-subcontractors, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 4.7.1 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Subcontractor, or the Subcontractor's Sub-subcontractors under workers' compensation acts, disability benefit acts, or other employee benefit acts.

**§ 4.7.3** The Contractor, in its sole discretion, reserves the right to retain, at the Subcontractor's cost and expense, its own attorney to defend it, the Owner, and/or other indemnified parties under the Prime Contractor or this Agreement, against a claim covered by Section 4.7. The Contractor's reservation of such election to defend itself with attorneys of its choice shall not limit the Subcontractor's obligations under Section 4.7.

#### **§ 4.8 Remedies for Nonpayment**

If the Contractor does not pay the Subcontractor through no fault of the Subcontractor, within seven days from the time payment should be made as provided in this Agreement, the Subcontractor may, without prejudice to any other available remedies, upon seven additional days' notice to the Contractor, stop the Work of this Subcontract until payment of the amount owing has been received. The Subcontract Sum shall, by appropriate Modification, be increased by the amount of the Subcontractor's reasonable and direct costs of demobilization, delay, and remobilization if permitted under Section 5.4.

#### **§ 4.9 Professional Services Provided by Subcontractor**

**§ 4.9.1** The Subcontractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Subcontract Documents or unless the Subcontractor is required to provide such services in order to carry out the Subcontractor's responsibilities for its own construction means, methods, techniques, sequences, and procedures. The Subcontractor shall not be required to provide professional services in violation of applicable law.

**§ 4.9.2** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Subcontractor by the Subcontract Documents, the Contractor will provide all performance and design criteria that such services must satisfy to the extent the Contractor has received such performance and design criteria from the Owner and Architect under the terms of the Prime Contract.

§ 4.9.3 If professional design services or certifications by a design professional are required because of means, methods, techniques, sequences, or procedures required by the Contractor and related to the Work of the Subcontractor, the Contractor will provide all performance and design criteria that such services must satisfy.

§ 4.9.4 The Subcontractor shall be entitled to rely upon the adequacy, accuracy, and completeness of the performance and design criteria received from the Contractor under this Section 4.9.

§ 4.9.5 The Subcontractor shall cause the professional services performed under this Section 4.9 to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop drawings and other submittals related to the Work designed by such design professional shall bear the professional's written approval when submitted to the Contractor. The Contractor shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals, provided the Contractor has provided to the Subcontractor all performance and design criteria required by this Section 4.9.

## ARTICLE 5 CHANGES IN THE WORK

§ 5.1 The Owner may make changes in the Work by issuing Modifications to the Prime Contract. Upon receipt of a Modification to the Prime Contract issued subsequent to the execution of this Agreement, the Contractor shall promptly notify the Subcontractor of such Modification. Unless otherwise directed by the Contractor, the Subcontractor shall not thereafter order materials or perform Work that would be inconsistent with the changes made by the Modification to the Prime Contract.

§ 5.2 The Subcontractor may be ordered in writing by the Contractor, without invalidating this Subcontract, to make changes in the Work within the general scope of this Subcontract consisting of additions, deletions, or other revisions, including those required by Modifications to the Prime Contract issued subsequent to the execution of this Agreement, with the Subcontract Sum and the Subcontract Time adjusted accordingly. The Subcontractor, prior to the commencement of such changed or revised Work, shall submit promptly to the Contractor written copies of a Claim for adjustment to the Subcontract Sum and Subcontract Time for such revised Work in a manner consistent with requirements of the Subcontract Documents. The Subcontractor agrees that the rates it may charge the Contractor shall be similarly limited in accordance with any limitations contained in the Prime Contract on the material or labor rates, overhead and profit that the Contractor may charge the Owner for work performed under a change order or change directive. The Contractor reserves the right to audit the Subcontractor's accounting, cost and all other records relating to the performance and cost of the Work.

§ 5.3 The Subcontractor shall make all Claims promptly to the Contractor for additional cost within seven (7) days of the event giving rise to the claim. Any untimely claim shall be deemed a waiver of that claim. A claim, however, which will affect or become part of a Claim which the Contractor is required to make under the Prime Contract within a specified time period or in a specified manner shall be made in sufficient time to permit the Contractor to satisfy the requirements of the Prime Contract. Such Claims shall be received by the Contractor not less than two working days preceding the time by which the Contractor's Claim must be made. Failure of the Subcontractor to make such a timely Claim shall bind the Subcontractor to the same consequences as those to which the Contractor is bound.

§ 5.4 Notwithstanding anything to the contrary in the Subcontract Documents, the Subcontractor shall not be entitled to damages or increased costs ("Damages") resulting from any delay, suspension, disruption, scheduling, rescheduling or coordination of the Work under the Subcontract or any other work under the Prime Contract (the "Delay"), however caused, unless such Delay was (i) not caused by the Subcontractor and (ii) the Contractor receives Damages for the Delay from the Owner. In such circumstances, however, the Subcontractor shall only be entitled to receive that portion of its Damages for a Delay that the Contractor receives from the Owner. The Contractor is under no obligation to prosecute or otherwise assert or bring a claim against the Owner for a Delay on behalf of the Subcontractor or otherwise.

§ 5.5 If there is a dispute regarding the performance or scope of the Work, or the entitlement to or the amount of any directed or requested change, or any other claim, the Subcontractor shall nevertheless diligently proceed with the performance of the Work, including that portion that may be in dispute, as directed by the Contractor.



## ARTICLE 6 CLAIMS AND DISPUTES

### § 6.1 Mediation

§ 6.1.1 Claims, disputes, or other matters in controversy arising out of or related to this Subcontract, except those waived as provided for in Sections 6.4 and 11.3.2, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 6.1.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to this Subcontract and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 6.1.2, the parties may nonetheless proceed to the selection of the arbitrators(s) and agree upon a schedule for later proceedings.

§ 6.1.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

### § 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by mediation pursuant to Section 6.1, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

☒ Arbitration pursuant to Section 6.3 of this Agreement

☐ Litigation in a court of competent jurisdiction

☐ Other: *(Specify)*

☐

If the Contractor and Subcontractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

### § 6.3 Arbitration

§ 6.3.1 If the Contractor and Subcontractor have selected arbitration as the method of binding dispute resolution in Section 6.2, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of this Agreement. The arbitration should be conducted in the place where the Project is located unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Subcontract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 6.3.2 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred under the Prime Contract or by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 6.3.3 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 6.3.4 The foregoing agreement to arbitrate, and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

#### § 6.3.5 Consolidation or Joinder

§ 6.3.5.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation; (2) the arbitrations to be consolidated substantially involve common questions of law or fact; and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 6.3.5.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a Claim, dispute, or other matter in question not described in the written consent.

§ 6.3.5.3 The Contractor and Subcontractor grant to any person or entity made a party to an arbitration conducted under this Section 6.3, whether by joinder or consolidation, the same rights of joinder and consolidation as the Contractor and Subcontractor under this Agreement.

#### § 6.4 Waiver of Claims for Consequential Damages

The Subcontractor waives claims against the Contractor for consequential damages arising out of or relating to this Subcontract, including without limitation, any consequential damages due to either party's termination in accordance with Article 7. Nothing contained herein shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of this Agreement.

### ARTICLE 7 TERMINATION, SUSPENSION OR ASSIGNMENT OF THE SUBCONTRACT

#### § 7.1 Termination by the Subcontractor

The Subcontractor may terminate the Subcontract for (1) nonpayment of undisputed amounts due under this Subcontract for 60 days or longer for which the Contractor has received payment, or (2) a material breach by the Contractor. In the event of such termination by the Subcontractor for any reason which is not the fault of the Subcontractor, the Subcontractor's Sub-subcontractors, or their agents or employees or other persons or entities performing portions of the Work under contract with the Subcontractor, the Subcontractor shall be entitled to recover from the Contractor payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, but no other damages, including consequential damages or overhead and profit on work not executed and costs incurred by reason of such termination.

#### § 7.2 Termination by the Contractor

##### § 7.2.1 Termination for Cause

If the Subcontractor repeatedly fails or neglects to carry out the Work in accordance with the Subcontract Documents or otherwise to perform in accordance with this Subcontract and fails within a three-day period after receipt of notice to commence and continue correction of such default or neglect with diligence and promptness, the Contractor may, without prejudice to any other remedy the Contractor may have, terminate the Subcontract and finish the Subcontractor's Work by whatever method the Contractor may deem expedient. If the unpaid balance of the Subcontract Sum exceeds the expense of finishing the Subcontractor's Work and other damages incurred by the Contractor and not expressly waived, such excess shall be paid to the Subcontractor. If such expense and damages exceed the unpaid balance of the Subcontract Sum, the Subcontractor shall pay the difference to the Contractor. Upon determination by a court of competent jurisdiction or by an arbitrator that termination of this Agreement was wrongful, then such termination will be deemed converted to a termination for convenience.

##### § 7.2.2 Termination for Convenience

§ 7.2.2.1 The Contractor may terminate the Subcontract without cause and for its convenience upon seven (7) days written notice to the Subcontractor. If the Owner terminates the Prime Contract or the Subcontract for the Owner's convenience, the Contractor shall promptly deliver notice to the Subcontractor.

§ 7.2.2.2 In case of such termination for the Owner's or Contractor's convenience, the Subcontractor shall be entitled to receive payment for Work properly executed and proven loss with respect to materials, equipment, tools

and construction equipment and machinery, but no other damages, including overhead, profit, and consequential damages.

§ 7.2.2.3 Upon receipt of notice of termination, the Subcontractor shall

- .1 cease operations as directed by the Contractor in the notice;
- .2 take actions necessary, or that the Contractor may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing Sub-subcontracts and purchase orders and enter into no further Sub-subcontracts and purchase orders.

§ 7.2.2.4 Termination of this Subcontract by the Contractor shall not relieve the Subcontractor from its obligations in connection with the Work performed prior to the termination nor will such termination abrogate any obligations of the Subcontractor under, or rights or remedies afforded to the Contractor by this Subcontract or the Subcontract Documents included without limitation, the Subcontractor's insurance and indemnity obligations.

### § 7.3 Suspension by the Contractor for Convenience

§ 7.3.1 The Contractor may, without cause, order the Subcontractor in writing to suspend, delay, or interrupt the Work of this Subcontract in whole or in part for such period of time as the Contractor may determine. In the event of suspension ordered by the Contractor, the Subcontractor shall be entitled to an equitable adjustment of the Subcontract Time and, if permitted under Section 5.4, the Subcontract Sum.

§ 7.3.2 The Subcontract Time and Subcontract Sum shall be adjusted for increases in accordance with Section 5.4 for cost and time caused by suspension, delay or interruption as described in Section 7.3.1. No adjustment shall be made to the extent that

- .1 performance is, was or would have been so suspended, delayed, or interrupted by another cause for which the Subcontractor is responsible; or
- .2 an equitable adjustment is made or denied under another provision of this Subcontract.

### § 7.4 Assignment of the Subcontract

§ 7.4.1 The Contractor may assign the Subcontract, in whole or in part. Further, in the event the Owner terminates the Prime Contract for cause, this Subcontract may be assigned the Owner if permitted by the Prime Contract and provided the Owner accepts the assignment by notifying the Contractor and Subcontractor.

§ 7.4.2 Without the Contractor's written consent, the Subcontractor shall not assign the Subcontract or Work of this Subcontract, subcontract the whole of this Subcontract, or subcontract portions of this Subcontract.

## ARTICLE 8 THE WORK OF THIS SUBCONTRACT

§ 8.1 The Subcontractor shall execute the following portion of the Work described in the Subcontract Documents, including all labor, materials, equipment, services and other items required to complete such portion of the Work, except to the extent specifically indicated in the Subcontract Documents to be the responsibility of others.  
*(Insert a precise description of the Work of this Subcontract, referring where appropriate to numbers of Drawings, sections of Specifications and pages of Addenda, Modifications, and accepted alternates.)*

« »

§ 8.2 The Subcontractor shall perform the Work in accordance with the Subcontract Documents, the details of which are of the essence. The Subcontractor hereby assumes the entire responsibility and liability for all Work until completion and final acceptance of the Work by the Owner. In the event of any loss, damage or destruction thereof from any cause, the Subcontractor shall be liable thereof, and shall repair, rebuild and make good said loss, damage or destruction at the Subcontractor's cost.

§ 8.3 If the Subcontractor is performing design/build services, the Subcontractor shall coordinate its drawings and other instruments of service with those of the Project Architect and other appropriate or applicable design professionals and shall advise the architects or design professionals and the Contractor of any potential conflict. The Subcontractor grants to the Contractor a license to use and reproduce the Subcontractor's design/build documents for purposes of completing, constructing, using, maintaining and operating the Project. The Contractor has the authority to grant or assign similar licenses to the Owner, the architects and/or design professionals. The



Subcontractor's design/build document shall comply with any requirements of the Project Architect and/or other design professionals and with all applicable Laws.

## ARTICLE 9 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 9.1 The date of commencement of the Subcontractor's Work, shall be:

*(Check one of the following boxes.)*

- [ ☐ ] The date of this Agreement.
- [ ☐ ] A date set forth in a notice to proceed issued by the Contractor.
- [ ☐ ] Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Subcontractor's Work.)*
- [ ☐ ]

If a date of commencement of the Subcontractor's Work is not selected, then the date of commencement shall be the date of this Agreement.

### § 9.2 Subcontract Time

§ 9.2.1 The Subcontract Time is the period of time, including authorized adjustments, allotted in the Subcontract Documents for Substantial Completion of the Work described in the Subcontract Documents. The Subcontract Time shall be measured from the date of commencement of the Subcontractor's Work.

§ 9.2.2 Subject to adjustments of the Subcontract Time as provided in the Subcontract Documents, the Subcontractor shall achieve substantial completion of the Subcontractor's Work:

*(Check one of the following boxes and complete the necessary information.)*

- [ ☐ ] Not later than [ ] ( [ ] ) calendar days from the date of commencement of the Subcontractor's Work.
- [ ☐ ] By the following date: [ ]

§ 9.2.3 Subject to adjustments of the Subcontract Time as provided in the Subcontract Documents, if portions of the Subcontractor's Work are to be completed prior to substantial completion of the Subcontractor's Work, then the Subcontractor shall achieve earlier substantial completion of such portions by the following dates.

*(List all portions of the Subcontractor's Work required to achieve substantial completion of the Subcontractor's Portion of the Work.)*

Portion of Work

Substantial Completion

§ 9.2.4 If the Subcontractor fails to achieve substantial completion as provided in this Section 9.2, liquidated damages, if any, shall be assessed as set forth in Section 3.4.

§ 9.3 With respect to the obligations of both the Contractor and the Subcontractor, time is of the essence of this Subcontract. The Subcontractor shall, at its own cost and expense, increase its labor or otherwise accelerate performance if directed by the Contractor or otherwise required to maintain the scheduled progress of the Work or to achieve Project milestones/completion dates. Any Work necessary to be performed after regular working hours, on Sundays or Legal Holidays, for which the Subcontractor is responsible shall be performed without additional expense to the Contractor or Owner.

§ 9.4 No extension of time will be valid without the Contractor's written consent..

## ARTICLE 10 SUBCONTRACT SUM

§ 10.1 The Contractor shall pay the Subcontractor the Subcontract Sum in current funds for the Subcontractor's performance of the Subcontract. The Subcontract Sum shall be « » (\$ « »), subject to additions and deductions as provided in the Subcontract Documents.

### § 10.2 Alternates

§ 10.2.1 Alternates, if any, included in the Subcontract Sum:

Item	Price

§ 10.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Contractor following execution of this Agreement. Upon acceptance, the Contractor shall issue a Modification to this Subcontract: *(Insert below each alternate and the conditions that must be met for the Contractor to accept the alternate.)*

Item	Price	Conditions for Acceptance

§ 10.3 Unit prices, if any:

*(Identify and state the unit price, and quantity limitations, if any, to which the unit price will be applicable.)*

Item	Units and Limitations	Price Per Unit (\$0.00)

§ 10.4 Allowances, if any, included in the Subcontract Sum:

*(Identify allowance and state exclusions, if any, from the allowance price.)*

Item	Price

## ARTICLE 11 PAYMENTS

### § 11.1 Progress Payments

§ 11.1.1 Based upon Applications for Payment submitted to the Contractor by the Subcontractor, corresponding to Applications for Payment submitted by the Contractor to the Architect, and Certificates for Payment issued by the Architect, the Contractor shall make progress payments on account of the Subcontract Sum to the Subcontractor as provided below and elsewhere in the Subcontract Documents.

§ 11.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

« »

§ 11.1.3 Provided an Application for Payment is received by the Contractor not later than the twenty-fifth « 25<sup>th</sup> » day of a month, the Contractor shall include the Subcontractor's Work covered by that application in the next Application for Payment which the Contractor is entitled to submit to the Architect. The Contractor may delay payment to the Subcontractor until the Contractor receives payment from the Owner for the Work for which the Subcontractor seeks payment. The Contractor shall pay the Subcontractor each progress payment no later than seven calendar days after the Contractor receives payment from the Owner for that portion of the Subcontract Work for which payment is sought. The Subcontractor shall not be entitled to any interest for any delay of payment resulting from failure of the Owner to timely pay the Contractor for that portion of the Subcontract Work for which payment is sought.

§ 11.1.4 If the Subcontractor's Application for Payment is received by the Contractor after the application date fixed above, the Subcontractor's Work covered by it shall be included by the Contractor in the next Application for Payment submitted to the Architect.

§ 11.1.5 The Subcontractor shall submit to the Contractor a schedule of values prior to submitting the Subcontractor's first Application for Payment. Each subsequent Application for Payment shall be based upon the

most recent schedule of values submitted by the Subcontractor in accordance with the Subcontract Documents. The schedule of values shall allocate the entire Subcontract Sum among the various portions of the Subcontractor's Work and be prepared in such form and supported by such data to substantiate its accuracy as the Contractor may require, and unless objected to by the Contractor, shall be used as a basis for reviewing the Subcontractor's Applications for Payment.

§ 11.1.6 Applications for Payment submitted by the Subcontractor shall indicate the percentage of completion of each portion of the Subcontractor's Work as of the end of the period covered by the Application for Payment. In addition, notwithstanding anything in the Subcontract Documents to the contrary, in exchange for payment, the Subcontractor shall provide (i) all documents requested by the Owner or the Contractor with respect to such payments; (ii) releases and lien waivers from the Subcontractor and its Sub-Subcontractors for all Work through the date of the payment request; and (iii) a sworn statement identifying all Sub-subcontractors, the contract amounts and balances under the subcontracts with each and which Sub-subcontractors are to be paid from the funds being requested in the application for payment, and any other documents requested by the Contractor to substantiate the sworn statement.

§ 11.1.6.1 Notwithstanding anything in the Subcontract Documents to the contrary, the Contractor may withhold any payment in whole or in part because of (i) the Subcontractor's failure to comply with a term or condition of the Subcontract Documents; (ii) defective, incomplete or untimely Work; (iii) withholding of payments from the Contractor by the Owner due to an act, omission or breach of the Subcontractor; (iv) third party claims, including, but not limited to, threatened or actual lien or bond claims by a Sub-subcontractor; (v) discrepancies in Subcontractor's sworn statements; or (vi) the Subcontractor's failure upon demand to provide the Contractor with evidence satisfactory to the Contractor of the Subcontractor's compliance with its payment obligations under the Subcontract Documents. The Contractor shall have the right to use any withheld money to cure the reason for the withholding and any damages caused thereby.

§ 11.1.6.2 Notwithstanding anything in the Subcontract Documents to the contrary, the Subcontractor shall have the obligation to promptly pay its Sub-subcontractors and, with respect to lower tier Sub-subcontractors, to ensure that such Sub-subcontractors are paid. Should a lien be placed on the Project by a Sub-subcontractor of any tier, then the Subcontractor shall, at the Subcontractor's cost and expense, discharge the lien of record within seven (7) days of the Contractor's demand.

§ 11.1.7 Subject to the provisions of the Subcontract Documents, the amount of each progress payment shall be computed as follows:

§ 11.1.7.1 The amount of each progress payment shall first include:

- .1 That portion of the Subcontract Sum properly allocable to completed Work;
- .2 That portion of the Subcontract Sum properly allocable to materials and equipment delivered and suitably stored at the site by the Subcontractor for subsequent incorporation in the Subcontractor's Work or, if approved by the Contractor, suitably stored off the site at a location agreed upon in writing; and
- .3 The amount, if any, for changes in the Work that are not in dispute and have been properly authorized by the Contractor, to the same extent provided in the Prime Contract, pending a final determination by the Contractor of the cost of changes in the Subcontractor's Work, even though the Subcontract Sum has not yet been adjusted.

§ 11.1.7.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of previous payments made by the Contractor;
- .2 The amount, if any, for Work that remains uncorrected and for which the Contractor has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201-2017 for a cause that is the fault of the Subcontractor;
- .3 For Work performed or defects discovered since the last payment application, any amount for which the Contractor may withhold payment in whole or in part, as provided in Article 9 of AIA Document A201-2017, for a cause that is the fault of the Subcontractor; and
- .4 Retainage withheld pursuant to Section 11.1.8 of this Agreement.

### § 11.1.8 Retainage

§ 11.1.8.1 For each progress payment made prior to substantial completion of the Subcontractor's Work, the Contractor may withhold the following amounts as retainage from the payment otherwise due:  
*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

« 5% »

§ 11.1.8.1.1 The following items are not subject to retainage:  
*(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)*

« »

§ 11.1.8.2 Reduction or limitation of retainage, if any, shall be as follows:  
*(If the retainage established in Section 11.1.8.1 is to be modified prior to substantial completion of the entire Work, including modifications for substantial completion of portions of the Subcontractor's Work as provided in Section 9.2.3, insert provisions for such modification.)*

« »

§ 11.1.9 Upon the partial or entire disapproval by the Contractor of the Subcontractor's Application for Payment, the Contractor shall provide notice to the Subcontractor. If the Subcontractor disputes the Contractor's decision regarding a Subcontractor's Application for Payment in whole or in part, the Subcontractor may submit a Claim in accordance with Article 6. If the basis for the disapproval has been remedied, the Subcontractor shall be paid the amounts withheld. The Subcontractor shall timely proceed with the Work pending resolution of the reason for or amount of the withholding and the Contractor shall continue to perform its obligations under the Subcontract.

§ 11.1.10 Provided the Contractor has fulfilled its payment obligations under the Subcontract Documents, the Subcontractor shall defend and indemnify the Contractor and Owner from all loss, liability, damage, or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any of the Subcontractor's subcontractors, suppliers, or vendors of any tier. Upon receipt of notice of such lien claim or other claim for payment, the Contractor shall notify the Subcontractor. If approved by the applicable court, when required, the Subcontractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 11.1.11 No partial or final payment to the Subcontractor shall constitute approval or acceptance of the Work. The Subcontractor's receipt of payments from the Contractor shall not be a condition precedent to the Subcontractor's payment to its subcontractors and material suppliers. The Subcontractor is responsible to the Contractor for the acts or omissions of the Subcontractor's subcontractors and suppliers of any tier.

§ 11.1.12 With respect to any portion of the Subcontract Sum, the Contractor has the right, but no obligation, to issue joint checks to the Subcontractor and any supplier or subcontractor of the Subcontractor or make payment directly to a supplier or subcontractor of the Subcontractor. Any such payments shall be deducted from the Subcontract Sum. The Subcontractor shall pay the Contractor those portions of the Contractor payments under this section that are more than the Subcontract Sum. The Contractor has the right to make direct contact with a Sub-subcontractor or any other person or entity regarding claims/demands of that Sub-subcontractor or other person or entity.

### § 11.2 Substantial Completion

When the Subcontractor's Work or a designated portion thereof is substantially complete and in accordance with the requirements of the Prime Contract, the Contractor shall, upon application by the Subcontractor, make prompt Application for Payment for such Work. Within 30 days following issuance by the Architect of the Certificate for Payment covering such substantially completed Work, the Contractor shall, to the full extent allowed in the Prime Contract, make payment to the Subcontractor, deducting any portion of the funds for the Subcontractor's Work withheld in accordance with the certificate to cover costs of items to be completed or corrected by the Subcontractor. Such payment to the Subcontractor shall be the entire unpaid balance of the Subcontract Sum if a full release of retainage is allowed under the Prime Contract for the Subcontractor's Work prior to the completion of the entire Project. If the Prime Contract does not allow for a full release of retainage, then such payment shall be an amount which, when added to previous payments to the Subcontractor, will reduce the retainage on the Subcontractor's

substantially completed Work to the same percentage of retainage as that on the Contractor's Work covered by the certificate.

### § 11.3 Final Payment

§ 11.3.1 Final payment, constituting the entire unpaid balance of the Subcontract Sum, shall be made by the Contractor to the Subcontractor when the Subcontractor's Work is fully performed in accordance with the requirements of the Subcontract Documents, the Architect has issued a Certificate for Payment covering the Subcontractor's completed Work and the Contractor has received final payment for such Work from the Owner. If, for any cause which is not the fault of the Subcontractor, the Contractor does not pay the Subcontractor within seven days after receipt of payment from the Owner, final payment to the Subcontractor shall be made upon demand. Notwithstanding the foregoing, if retainage is withheld by the Owner from the Contractor for any portion of the Work, the final payment to the Subcontractor shall be reduced by the amount of the retainage allocable to the Subcontractor's portion of the Work, which amount shall not be due until three (3) working days after the Contractor's receipt of such retainage from the Owner.

*(Insert provisions for earlier final payment to the Subcontractor, if applicable.)*

« »

§ 11.3.2 In exchange for final payment, the Subcontractor shall submit evidence satisfactory to the Contractor that all payrolls, bills for materials and equipment, and all known indebtedness connected with the Subcontractor's Work have been satisfied, including, but not limited to, final lien waivers. Acceptance of final payment by the Subcontractor shall constitute a waiver of claims by the Subcontractor, except those previously made in writing and identified by the Subcontractor as unsettled at the time of final Application for Payment.

### § 11.4 Interest

Payments due and unpaid under this Subcontract shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

*(Insert rate of interest agreed upon, if any.)*

« » % « »

## ARTICLE 12 INSURANCE AND BONDS

### § 12.1 Subcontractor's Required Insurance Coverage

§ 12.1.1 The Subcontractor shall purchase and maintain the following types and limits of insurance, from a company or companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, as will protect the Subcontractor from claims that may arise out of, or result from, the Subcontractor's operations and completed operations under the Subcontract. If the Prime Contract requires larger limits or additional coverages, the Contractor reserves the right to require the Subcontractor to comply, at the Subcontractor's expense, with such larger limits.

*(Specify each type of insurance, such as commercial general liability, automobile, worker's compensation, employers' liability, professional liability, and pollution, required to be carried by the Subcontractor, the limits of coverage for each type of insurance, and any other pertinent requirements.)*

#### Type of Insurance

Commercial General Liability

#### Limits

· \$1,000,000 Per Occurrence  
· \$2,000,000 Annual or General Aggregate  
· \$2,000,000 Products/Completed Operations Aggregate

#### Other Pertinent Requirements

· "Per Project" Aggregate Endorsement  
· Waiver of Subrogation  
· Maintained on an Occurrence Basis

Automobile Insurance

\$1,000,000 Per Occurrence

· Coverage Applies to "Any Auto" or to "Owned/Non-Owned/Hired Autos"  
· Waiver of Subrogation  
· Maintained on an Occurrence Basis

Workers Compensation & Employers Liability	Statutory Limits	<ul style="list-style-type: none"> <li>·Waiver of Subrogation</li> <li>Stop Gap Coverage (if working in Monopolistic states)</li> <li>·Broad Form All States Endorsement (if working outside Wisconsin)</li> <li>·Maintained on an Occurrence Basis</li> </ul>
Excess/Umbrella Liability	\$5,000,000 Per Occurrence and Aggregate	<ul style="list-style-type: none"> <li>·Maintained two (2) years after final completion of the Project</li> <li>Follow Form terms and conditions to the underlying policies: (1) Commercial General Liability (2) Business Auto (3) Employers Liability</li> <li>Maintained on an Occurrence Basis</li> </ul>
Professional Liability (if Subcontractor is performing professional services)	\$1,000,000 Per Occurrence and Aggregate	Includes contractual liability retroactive to the earlier date of the Subcontract or the Commencement of Work Shall provide “errors and omissions” coverage covering negligent acts, errors and omissions in Subcontractors and its Subcontractors’ professional obligations under this Subcontract

§ 12.1.2 Coverages, written on an occurrence basis, shall be maintained without interruption from the date of commencement of the Subcontractor’s Work until the date of final payment and termination of any coverage required to be maintained after final payment to the Subcontractor, and, with respect to the Subcontractor’s completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Prime Contract.

§ 12.1.3 If professional services are required under Section 4.9, the Subcontractor shall provide the professional liability insurance coverage required under this Section 12.1 for the following period after completion of the Work:

« Two (2) years »

§ 12.1.4 **Certificates of Insurance.** The Subcontractor shall provide certificates of insurance acceptable to the Contractor evidencing compliance with the requirements in this Article 12 at the following times: (1) prior to commencement of the Subcontractor’s Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Contractor’s written request. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the time required in this Article 12. The certificates shall show the Contractor and the Owner as additional insureds on the Subcontractor’s Commercial General Liability and any excess or umbrella liability policy. Failure of the Contractor to demand such certificates or other evidence of the Subcontractor’s full compliance with required insurance coverages and limits, or failure of the Contractor to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of the Subcontractor’s obligation to maintain insurance required by this Agreement.

§ 12.1.5 **Deductibles and Self-Insured Retentions.** The Subcontractor shall disclose to the Contractor any deductible or self-insured retentions applicable to any insurance required to be provided by the Subcontractor.



**§ 12.1.6 Additional Insured Obligations.** To the fullest extent permitted by law, the Subcontractor shall cause its commercial general liability coverage to include: (1) the Contractor, the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Subcontractor's negligent acts or omissions during the Subcontractor's operations; and (2) the Contractor and Owner as additional insureds for claims caused in whole or in part by the Subcontractor's negligent acts or omissions for which loss occurs during the Subcontractor's completed operations. The additional insured coverage shall be primary and non-contributory to any of the Contractor's and Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

**§ 12.1.7 Notice of Cancellation or Change in Coverage.** Within thirty (30) days of the date the Subcontractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Subcontract Documents, the Subcontractor shall provide notice to the Contractor of such impending or actual cancellation or expiration. Upon receipt of notice from the Subcontractor, the Contractor shall, unless the lapse in coverage arises from an act or omission of the Contractor, have the right to suspend the Work in accordance with this Agreement until the lapse in coverage has been cured by the procurement of replacement coverage by the Subcontractor. The furnishing of notice by the Subcontractor shall not relieve the Subcontractor of any contractual obligation to provide any required coverage.

**§ 12.2 Subcontractor's Required Performance Bond and Payment Bond**

**§ 12.2.1** The Subcontractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:  
(Specify type and penal sum of bonds.)

**Type**

Payment Bond

Performance Bond

**Penal Sum**

If selected at the Contractor's option, the Subcontractor will be required to provide a Payment Bond for 100% of the Subcontract Sum. Should the Subcontract Sum change during the project, the bonded amount will change to reflect the Subcontract Sum.  
If selected at the Contractor's option, the Subcontractor will be required to provide a Performance Bond for 100% of the Subcontract Sum. Should the Subcontract Sum change during the project, the bonded amount will change to reflect the Subcontract Sum.

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

**§ 12.2.2** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations under this Agreement, the Subcontractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

**§ 12.3 Contractor's Insurance and Bond Obligations**

**§ 12.3.1** The Contractor shall promptly, upon request of the Subcontractor, furnish a copy or permit a copy to be made of any bond covering payment of obligations arising under the Subcontract.

**§ 12.4 Property Insurance**

**§ 12.4.1** When requested in writing, the Contractor shall provide the Subcontractor with copies of the property and equipment policies in effect for the Project, to the extent copies of the policies are available to the Contractor.

**§ 12.5 Waivers of Subrogation**

The Contractor and Subcontractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other, and (2) the Owner, the Architect, the Architect's consultants, and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and

employees for damages caused by fire or other causes of loss to the extent those losses are covered by property insurance provided under the Prime Contract or other property insurance applicable to the Work or to property at or adjacent to the Project site, except such rights as they may have to proceeds of such insurance held by the Owner as a fiduciary. The Subcontractor shall require similar written waivers in favor of the individuals and entities enumerated herein from the Subcontractor's Sub-subcontractors, agents, and employees. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 12.5 shall not prohibit this waiver of subrogation, which shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the property damaged. This waiver of subrogation is only applicable to the amount covered by insurance. Any deductibles or non-insurable costs are not subject to a waiver of subrogation and is open for litigation or arbitration to determine who should pay that portion not covered by insurance.

## **ARTICLE 13 TEMPORARY FACILITIES, SERVICES, EQUIPMENT AND WORKING CONDITIONS**

**§ 13.1** The Contractor shall furnish and make the Contractor's temporary facilities and services available to the Subcontractor at no cost, except as noted below:

« »

**§ 13.2** The Contractor's equipment will be available to the Subcontractor only at the Contractor's discretion and on mutually satisfactory terms, except as noted below:

« In the event the Subcontractor or Sub-subcontractor, by rental, loan or otherwise, makes use of any of the Owner's or Contractor's equipment, scaffolding, or other appliances, Subcontractor shall be deemed to agree, by signing this Subcontract, that, prior to such use, it will ensure that the persons using such items are properly trained and, if necessary, licensed to use such items and that it (i) accepts such items in their "as is" conditions; and (ii) will use such items at the sole risk of the person using such items. Subcontractor shall defend, hold harmless and indemnify the Contractor and its officers, directors, employees, insurers, agents, successors and assigns from and against all claims, fines, penalties, damages, losses and expenses, including attorneys' fees, of every nature and of every kind arising from or incidental to Subcontractor's or its Sub-subcontractors' use thereof, regardless of the cause of the claim, fine, penalty, damage or loss. »

**§ 13.3** Specific working conditions as noted below:

*(Insert any specific arrangements or requirements concerning working conditions and labor matters applicable to the Subcontractor's Work.)*

« The Subcontractor agrees that any OSHA or other governmental agency fines, fees or assessments imposed on the Contractor due to negligence or code violations of the Subcontractor or its subcontractors shall be reimbursed by the Subcontractor to the Contractor in full. »

## **ARTICLE 14 MISCELLANEOUS PROVISIONS**

**§ 14.1** Where reference is made in this Subcontract to a provision of another Subcontract Document, the reference refers to that provision as amended or supplemented by other provisions of the Subcontract Documents.

**§ 14.2** The Contractor's representative:

*(Name, address, email address and other information)*

« »

« »

« »

« »

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« »

**§ 14.3** The Subcontractor's representative:

*(Name, address, email address and other information)*

« »



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#### § 14.4 Notice

§ 14.4.1 Except as otherwise provided in Section 14.4.2, where the Subcontract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic notice is set forth in Section 14.4.3.

§ 14.4.2 Notice of Claims shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 14.4.3 Notice in electronic format, pursuant to Section 14.4.1, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

*(If other than in accordance with AIA Document E203™–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

<< >>

§ 14.5 Neither the Contractor's nor the Subcontractor's representative shall be changed without ten days' prior notice to the other party.

§ 14.6 The invalidity of any provision of the Subcontract Documents shall not invalidate the Subcontract or its remaining provisions. If it is determined that any provision of the Subcontract violates any law or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case, the Subcontract shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Subcontract.

§ 14.7 The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 14.7.1 Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

§ 14.8 The Contractor and/or Owner shall be permitted to occupy and/or use any portion of the Work that has been either partially or fully completed by the Subcontractor before final inspection or final acceptance thereof by the Owner and the Contractor. Such use and/or occupation shall not relieve the Subcontractor of its responsibility under the Subcontract Documents for that portion of the Work nor of its obligation to make good, at its own expense, any defect in materials and/or workmanship of the Work.

§ 14.9 The Subcontractor shall pay all attorney fees and costs the Contractor may incur in (i) enforcing any term or condition of this Agreement in connection with any demand or action commenced by or involving any creditor of the Subcontractor, including any sub-subcontractor or material supplier that contributed labor or materials for the Work (ii) enforcing any term or condition of this Agreement in connection with the defense or settlement of any claim or demand of the Subcontractor or its subcontractor or arising from the Subcontractor's breach of the Subcontract or, (iii) in connection with the successful defense or settlement of any claim or demand of the

Subcontractor.

§ 14.10 This Agreement shall be binding upon and inure to the benefit of both parties and their respective heirs, successors and assigns. This Agreement represents the full and final agreement of the parties and supersedes all prior written and oral communications between the parties. The terms of this Agreement are to be interpreted and applied to the fullest extent permitted by law. The partial or complete invalidity of one or more provisions or portion of this Agreement shall not affect the validity or continuing force and effect of any other provision or portion thereof. The failure of the Contractor, in any one or more instances, to insist upon the performances of any of the terms, covenants or conditions of this Agreement, or to exercise any right granted herein, shall not be construed as a waiver or relinquishment of such term, covenant, condition or right.

§ 14.11 In no event shall the Contractor be liable to the Subcontractor for, and the Subcontractor waives claims for, any consequential or incidental damages, including but not limited to, lost profits on Work not executed, lost profits/opportunity costs and inefficiencies in the performance of the Work, arising from, relating to or incidental to the performance, coordination, or suspension of the Work or the Subcontract, including a breach or the termination thereof, or the Project.

#### ARTICLE 15 ENUMERATION OF SUBCONTRACT DOCUMENTS

§ 15.1 This Agreement is comprised of the following documents:

- .1 AIA Document A401™–2017, Standard Form Agreement Between Contractor and Subcontractor, as modified by the parties;
- .2 Prime Agreement between the Owner and Contractor, including all exhibits thereto;
- .3 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if not included in the Prime Agreement, dated as indicated below:  
*(Insert the date of the E203–2013 incorporated into this Agreement.)*

« »

- .4 Other Exhibits incorporated into this Agreement:  
*(Clearly identify any other exhibits incorporated into this Agreement.)*

« Exhibit A – Subcontract Agreement – Insurance Requirements  
Exhibit B – Safety & Health Orientation »

- .5 Other documents:  
*(List other documents, if any, forming part of the Agreement.)*

« »

This Agreement entered into as of the day and year first written above.

\_\_\_\_\_  
**CONTRACTOR (Signature)**

« »« »

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
**SUBCONTRACTOR (Signature)**

« »« »

\_\_\_\_\_  
*(Printed name and title)*

## Subcontractor Agreement – Insurance Requirements

### Exhibit A Insurance Requirements

Subcontractors must comply with the following minimum insurance limits, coverages and requirements as shown below or, if higher, the requirements set forth by the Owner.

Limits	
Commercial General Liability	<ul style="list-style-type: none"> <li>Coverage Limits of :               <ul style="list-style-type: none"> <li>\$ 1,000,000 Per Occurrence</li> <li>\$ 2,000,000 Annual or General Aggregate</li> <li>\$ 2,000,000 Products/ Completed Operations Aggregate</li> </ul> </li> </ul>
Business Auto	<ul style="list-style-type: none"> <li>Liability Coverage Limits:               <ul style="list-style-type: none"> <li>\$ 1,000,000 Combined Single Limit</li> </ul> </li> </ul>
Umbrella	<ul style="list-style-type: none"> <li>Coverage Limits of \$ 5,000,000</li> </ul>
Workers Compensation & Employers Liability	<ul style="list-style-type: none"> <li>Employer Liability Limits:               <ul style="list-style-type: none"> <li>\$ 100,000 Bodily Injury by Accident/Each Accident</li> <li>\$ 500,000 Bodily Injury by Disease/Policy Limit</li> <li>\$ 100,000 Bodily Injury by Disease/Each Employee</li> </ul> </li> </ul>
Professional Liability <i>*If providing professional services</i>	<ul style="list-style-type: none"> <li>Coverage Limits of:               <ul style="list-style-type: none"> <li>\$1,000,000 Per Occurrence</li> <li>\$1,000,000 General Aggregate</li> </ul> </li> </ul>

Coverage	
Commercial General Liability	<ul style="list-style-type: none"> <li>Maas Brothers, Owner, and any other person or entity required under the Prime Contract named Additional Insured – including Ongoing &amp; Completed Operations (CG 2010 07 04 and CG 2037 07 04 or equivalent)</li> <li>Primary &amp; Non-contributory wording with respects to Additional Insured status</li> <li>“Per Project” Aggregate Endorsement</li> <li>Waiver of Subrogation</li> </ul>
Business Auto	<ul style="list-style-type: none"> <li>Coverage Applies to “Any Auto” or to “Owned/Non-Owned/Hired Autos”</li> <li>Waiver of Subrogation</li> </ul>
Workers Compensation & Employers Liability	<ul style="list-style-type: none"> <li>Waiver of Subrogation</li> <li>Stop Gap Coverage (if working in Monopolistic states)</li> <li>Broad Form All States Endorsement (if working outside of Wisconsin)</li> </ul>
Professional Liability	<ul style="list-style-type: none"> <li>Required when performing professional services as determined by Owner and Contractor</li> <li>Maintained for a period of two (2) years after Substantial Completion</li> <li>Errors &amp; Omissions Coverage</li> </ul>
Umbrella	<ul style="list-style-type: none"> <li>Follow Form terms and conditions to the underlying policies:               <ol style="list-style-type: none"> <li>Commercial General Liability</li> <li>Business Auto</li> <li>Employers Liability</li> </ol> </li> </ul>
Carrier Best Rating	<ul style="list-style-type: none"> <li>Best Rating of not less than “A”</li> </ul>
Notice of Cancellation	<ul style="list-style-type: none"> <li>30 Day Notice of Cancellation, Non-Renewal or Material Change except for non-payment of premium (10 Days)</li> </ul>

Certificates of Insurance, or copies of policies if required by Contractor, shall be furnished to the Contractor before performance of any work and/or release of any funds from Contractor in connection with the work. If additional limits or coverage's are required by the agreement between Owner and Contractor, Subcontractor will obtain such coverage at no additional cost.

## EXHIBIT B

### SAFETY & HEALTH ORIENTATION

2022

This form provides a basis for the safety requirements on Maas Brothers Construction Co., Inc. jobsites. This information should not be considered all-inclusive, and along with these requirements, all governing safety codes and project policies must be followed. All personnel onsite need to cooperate to ensure everyone goes home in a safe and healthy manner.

- **Overall Safety Responsibility:** All unsafe acts, conditions, or behaviors must be immediately reported first to the individuals involved and then to the Maas Brothers superintendent
- **Competent Person:** Each contractor must designate a Competent Person (as defined by OSHA) that must be onsite when its employees are working.
- **Training:** Equipment or hazard-specific training must be documented and made available upon request, per OSHA requirements
- **Hazard Elimination:** If you create a hazard, it is your responsibility to safeguard that hazard. If you take down, remove, or bypass another contractor's safety control measures, it is your responsibility to protect yourself and/or others at that time.
- **Hazardous Areas:** Must be properly barricaded and maintained, by the contractor creating the hazard, to restrict access by others not involved in the work.
- **Site Access/Work Hours:** General work hours and personnel sign-in requirements will be on a per-project basis. Coordinate after work hours with the Maas Brothers superintendent. At no time shall there be solo work onsite.
- **Parking Restrictions:** Parking is allowed in designated areas only. Parking may change as the job progresses.
- **Emergency Procedures:** The Maas Brothers field office is the emergency meeting area unless designated otherwise. Employees are reminded to "keep stairs and pathways clean" for emergency egress. Storm shelters will be designated by the Maas Brothers superintendent.
- **Incident Reporting:** Any incident, near hit, or property damage must be reported to the Maas Brothers superintendent, regardless of its perceived severity.
- **Maas Brothers Tools/Equipment:** No equipment, tools, or supplies owned by Maas Brothers are to be used without authorization of the Maas Brothers superintendent
- **Security:** Site security will be developed on a per-project basis. Security of tools, equipment, and supplies will be the responsibility of each contractor.
- **Deliveries/Storage:** Must be kept clean, orderly and coordinated with the Maas Brothers superintendent.
- **Flammable and Combustible Material:** Must be stored in proper containers and in designated areas, not throughout the building.
- **Safety Data Sheets (SDS):** The contractor providing materials to the jobsite is responsible for providing SDS upon request.
- **Personal Conduct:** Sexual or other forms of harassment, horseplay, intimidation, violence, and/or threats will not be tolerated. This includes towards the general public and to those working on site.
- **Drugs and Alcohol:** Will not be tolerated. No one under the influence of any amounts of alcohol or illegal drugs is allowed on site.
- **Excavations:** Excavations are to be protected based on soil type per OSHA requirements. Inspections must be completed as necessary by the responsible contractor.
- **Fall Protection:** All work requiring fall protection must comply with by OSHA regulations. A *Roof Access Permit* is to be completed by the contractor performing work requiring fall protection, except for work on scaffold, scissor lifts, or aerial lifts.
- **Floor Holes:** The contractor creating floor holes  $\geq 2"$  are responsible for covering, securing and labeling the hole.
- **Aerial & Scissor Lifts:** A full personal fall arrest system must be utilized at all times while in boom lifts and available for use in scissor lifts.
- **Forklifts (PIT) & Other Heavy Equipment:** All personnel must have appropriate training. ***Seat belts must be worn at all times.***
- **Head Protection:** Hard hats shall be worn 100% of the time.
- **Eye Protection:** ANSI Z87.1 eyewear with side shield must be worn 100% of the time. Dark eyewear shall not be worn when working indoors.
- **Hearing Protection:** Hearing protection must be used when sound levels are at or above 85 dBA.
- **Hi-Visibility Apparel:** Hi-Visibility apparel must be worn during period of high vehicle traffic – up to the discretion of the Maas Brothers superintendent. Appropriate apparel includes safety green or orange tops or any apparel where reflective tape is present.
- **Work Shirts:** T-shirt with a minimum 4-inch sleeve shall be worn
- **Work Pants:** All workers must wear long pants that are in good condition. Shorts or cut-offs will not be allowed.
- **Work Shoes:** Sturdy work shoes should be worn at all times. Tennis shoes are not allowed.

- **Confined Space:** Each contractor must evaluate their work area to determine if it meets the definition of a confined space. Permits are required where deemed necessary. Personnel must be trained in confined space entry per OSHA requirements.
- **Cranes:** Contractors requiring crane use for their work must complete a *Crane Lift Plan* prior to performing any lifts onsite. Proper crane setup, load weight, crane capacity, rigging, signaling, and swing area must be reviewed.
- **Airborne Contaminants/Respiratory Protection:** Each contractor is responsible for determining appropriate controls of airborne contaminants they may produce or appropriate respiratory protection for their employees where necessary per OSHA regulations. Airborne contaminants must not affect other contractors working in vicinity.
- **Entertainment Devices:** Media or personal entertainment devices are prohibited. If you have a personal cell phone or camera on site, it may be subject to search. Radio use will be subject to the Maas Brothers superintendent discretion.
- **Tobacco Products:** Absolutely no tobacco products in existing buildings or once interior finishes have started. Use of tobacco, including smokeless or vaping is up to owner or the Maas Brothers superintendent discretion.
- **Housekeeping:** Clean as you go. This includes food scraps, soda bottles or cans, and food packages, etc.
- **Dumpster Use:** Only those contractors designated may use Maas Brothers dumpsters. Unauthorized personnel using jobsite dumpsters will reimburse Maas Brothers.
- **Electrical Sources:** Electrical rooms and panels are to be accessed by qualified and authorized electricians only. Live work must be approved by Maas Brothers superintendent. NFPA 70E must be followed.
- **Scaffolding:** Must be set up according to OSHA regulations. Rolling scaffolding must have the casters locked when in use.
- **Electrical Equipment:** Electric power extension cords and tools must be inspected and marked with appropriate assured grounding code. (Jan.-Mar. =White; Apr.-June = Green; July-Sept. =Red; Oct.- Dec. =Orange) Assured grounding is to be used in combination with GFCI protection.
- **Ladders:** Must be set up and used per OSHA regulations: secured from displacement and extend 3-ft. past the landing point if being used to access an upper level, items shall not be carried by hand up access ladder, do not stand or sit on top 2 steps, step ladders must be used in open position.
- **Fire Extinguishers and a "Fire Watch":** Fire Watch person, where required, and fire extinguisher shall be supplied by the contractor performing "hot work" activities. Do not take building fire extinguishers for hot work use.
- **"Hot Work" Permits:** A hot work permit may be issued by the Maas Brothers superintendent as required by the task and/or project.
- **Safety Meetings:** Must be conducted at least weekly and made available for review by the Maas Brothers superintendent upon request.
- **Media Correspondence:** All media contacts, interviews or other communications must be channeled through the Maas Brothers superintendent.
- **Repeat Violations:** Will not be tolerated and are subject to disciplinary actions up to and including immediate removal from the project.

**I have read, understand, and agree to comply with the safety and health orientation on the above items. I also understand that this list is not all-inclusive and agree to follow all governing safety codes and project policies to ensure safety on this jobsite.**

Company Name (Print): \_\_\_\_\_

Employee Name (Print): \_\_\_\_\_

Employee Signature: \_\_\_\_\_

Emergency Contact Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Maas Brothers Representative: \_\_\_\_\_ Date: \_\_\_\_\_

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## **SECTION 007300 - SUPPLEMENTARY CONDITIONS**

The General Conditions of the Contract for Construction, AIA Document 201, 2017, Articles 1 through 15 inclusive, is part of the contract between the subcontractors and Maas Brothers Construction Co., Inc. and is included by reference as if bound in these Specifications. Copies of this document may be made available upon request.

The following Supplementary Conditions modify or add to the General Conditions. Where any part of the General Conditions is modified by these articles, the unaltered provisions of that part shall remain in full effect.

In the event of any conflict of meaning between the Supplementary Conditions and the said General Conditions of the Contract for Construction, provisions of the Supplementary Conditions shall control.

### **ARTICLE 1 GENERAL PROVISIONS**

Subarticle 1.2 **Correlation and Intent of the Contract Documents**, add the following subparagraphs:

1.2.4 The General Conditions, Supplementary General Conditions, Special Conditions and the General Requirements along with other Division 0 and 1 Sections shall apply to all sections of the Specifications. Section of Division 1 – General Requirements govern the execution of the work of all sections of the specifications.

1.2.5 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

1. The Agreement
2. Addenda, with those of later date having precedence over those of earlier date
3. The Supplementary Conditions
4. The General Conditions of the Contract for Construction
5. The General Requirements of Division 0 and 1
6. The Specifications
7. The Drawings

1.2.5.1 In the case of an inconsistency between Drawings and Specifications or within either document not clarified by Addenda, the better quality or greater quantity of Work shall be provided by the Subcontractor or vendor in accordance with Maas Brothers Construction Co., Inc.'s interpretation.

1.2.5.2 In the case work or materials are specified and/or shown on drawings to be done or provided by more than one Contractor, each such Contractor shall be deemed to have figured the item with Maas Brothers Construction Co., Inc. determining who shall provide work and who shall submit a credit for work.

1.2.5.3 Each Contractor must provide all work and materials which any sections or part of the plans, drawings, specifications and conditions require it to provide regardless of whether or not such requirement is faithfully repeated in other parts or sections thereof to which the provision might be appropriate.

### **ARTICLE 3 CONTRACTOR**

Subarticle 3.1.1, add the following subparagraph:

3.1.1.1 Where the word Contractor occurs in this article, each contractor, subcontractor or material supplier shall be considered a contractor and shall meet the same obligations.

3.1.1.2 Where word Contractor occurs in sections of specifications, same shall mean Contractor, subcontractor or material supplier for that particular section.

Subarticle **Labor and Materials**, add the following subparagraph:

3.4.4 Each Contractor must supply its own supervision and other staff to properly execute the work under its Contract as necessary.

3.4.5 Contractors and subcontractors employed upon work shall be required to conform to the local and state labor laws and various acts amendatory and supplementary thereto and to other laws, ordinance and legal requirements applicable thereto.

3.4.6 Employee of the Subcontractor whose work is unsatisfactory to the Owner, Architect, or Maas Brothers Construction Co., Inc. or who is considered to be careless, disrespectful, incompetent, unskilled or otherwise objectionable, shall be dismissed from the work immediately upon notice from Maas Brothers Construction Co., Inc. Superintendents and/or Foreman will not be removed from this project unless approved in writing by Maas Brothers Construction Co., Inc.

## **ARTICLE 7 CHANGES IN THE WORK**

Subarticle 7.2 **Change Orders**, add the following subparagraphs:

7.2.2 Any change order request from a Subcontractor or Vendor for a project change of any kind, initiated by the Owner, Architect, Contractor, or another Subcontractor or Vendor must be submitted no later than five (5) working days after the notification of such change. A Subcontractor or Vendor failing to meet this time constraint will waive any rights for a later claim.

7.2.4 Change Orders will be based on actual costs, including materials and trucking directly attributable to the change plus any tax and delivery, cost of labor directly attributable to the change (Base pay plus employee fringes, payroll taxes, and insurance only), cost of equipment and tools directly attributable to the change, and cost of subcontracts directly attributable to the change, plus a maximum of ten percent (10%) for overhead and profit on directly provided labor, material and equipment and sub-contracts. Overhead and profit, as stated above, shall include all general administrative expenses, project management, engineering, general supervision, and other labor, materials, and equipment not directly related to the change. When the value of a change order exceeds \$30,000, a declining scale will be used to negotiate the allowable combined overhead and profit. When the value of deductive change order exceeds \$30,000 a reasonable allowance for overhead and profit will be negotiated and included as part of the change order. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net change to the contract sum.

## **ARTICLE 8 TIME**

Subarticle 8.2 **Progress and Completion**, add the following subparagraphs:

8.2.4 General Sequence of Construction Operations: The sequence of operations or the place of commencement shall be determined by Maas Brothers Construction Co., Inc. as deemed to best serve the needs and convenience of the Owner or as necessity of occasion requires. The progress schedule is not intended to limit the progress of any one or more Contracts but rather establishes a general guide for all Contractors, based upon priorities established by the Owner so as to promote insofar as possible the best harmony between Owner's priorities and construction schedules.

8.2.5 Contractors agree that said work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will ensure the completion of the project by the dates listed. It is expressly understood and agreed by and between Contractors and Owner, that time for completion of work described herein is reasonable time for completion of same.

## **ARTICLE 9 PAYMENTS AND COMPLETION**

Subarticle 9.6.2, add the following subparagraphs:



9.6.2.1 Lien waiver, corresponding to requested amount, must be submitted with each request for payment.

9.6.2.2 Lien waivers from Sub-subcontractors and materials suppliers are required to be submitted monthly to Maas Brothers Construction Co., Inc. 9.6.2.3 Amounts to be retained will be as follows: 5% will be retained until substantial completion.

## **ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

Subarticle 10.2.3, add the following subparagraphs:

10.2.3.1 Subcontractors shall take care to prevent damage to their staged materials and work in place that may be impacted by weather or onsite operations. Where a Subcontractor's operations may impact work in place by others, the Subcontractor shall provide temporary protections as necessary for the prevention of damage.

Subarticle 10.2.5, add the following subparagraphs:

10.2.5.1 Where a Subcontractor's operations damage staged materials or work in place, repair, and any associated costs, shall be the responsibility of the Subcontractor causing damage. If responsibility cannot be determined, the cost of repair or replacement shall be prorated among the Subcontractors present on the project site at the time the damage occurred.

Subarticle 10.3 **Hazardous Materials and Substances**, add the following paragraphs:

10.3.7 In the event the Subcontractor encounters any material on the site reasonably believed to be hazardous, the Subcontractor shall immediately report the condition to Maas Brothers.

10.3.8 As stated in the outline of the OSHA Standard, a copy of the Subcontractor's Hazard Communication Program must be located on site prior to starting work. The filing of this program is required whenever workers are physically working on the project. The Safety Data Sheets will be required on any and all materials purchased and used on the project.

## **ARTICLE 11 INSURANCE AND BONDS**

Subarticle 11.1 **Contractors Liability Insurance**, see sample Maas Brothers Construction Co., Inc. AIA A401-2017 Subcontract Agreement for specific insurance amounts. Add the following paragraphs:

11.1.1.1 The Architect/Engineer, Maas Brothers Construction Co., Inc. and Owner assume no responsibility in the event that limits such as above are not adequate.

END OF SECTION

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# **SPECIFICATIONS**

## **DIVISION 01**



## **SECTION 01 10 00 - SUMMARY**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

##### **A. Section Includes:**

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work under Owner's separate contracts.
5. Owner-furnished/Contractor-installed (OFCI) products.
6. Owner-furnished/Owner-installed (OFOI) products.
7. Contractor's use of site and premises.
8. Coordination with occupants.
9. Work restrictions.
10. Specification and Drawing conventions.
11. Miscellaneous provisions.

##### **B. Related Requirements:**

1. Section 01 31 00 "Project Management and Coordination" for process for resolving questions.
2. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
3. Section 01 73 00 "Execution" for coordination of Owner-installed products.

#### **1.3 PROJECT INFORMATION**

- A. Project Identification: Jefferson County Courthouse and Sheriff's Building Renovations and Additions.

1. Project Location: Jefferson, WI.

- B. Owner: Jefferson County Insert name and address of Owner.

- C. Architect: Potter Lawson, Inc, Madison, WI.

- D. Construction Manager: Maas Brothers Construction Company.

1. Construction Manager Representative: Mark Stafford.
2. Construction Manager for this Project is Project's constructor. The terms "Construction Manager" and "Contractor" are synonymous.

#### **1.4 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. The work will include reorganizing the County Administrative departments, Courts, Sheriff's department and Jail to improve security, functional efficiencies and future growth. This project consists of three new additions; the Administrative northeast addition, Courts addition and the Law Enforcement Center addition, totaling over 36,000 sf. The renovation covers approximately 105,500 sf of which 57,600 sf is considered Level 2 remodeling. Extensive mechanical, electrical, plumbing and technology systems are to be replaced or upgraded. A fire protection/sprinkler system will be added to the Courthouse side of the facility. Site work includes updating miscellaneous site utilities including adding a storm water system along S. Center Ave. The current MIS building located at 402 S. Center Ave is to be demolished allowing for the County parking lot just south of the site to be expanded onto the MIS site, and other Work indicated in the Contract Documents.
- B. Type of Contract:
1. Project will be constructed under coordinated, concurrent multiple contracts. See bid categories for a list of multiple contracts and a description of work included under each of the multiple contracts.
- 1.5 PHASED CONSTRUCTION
- A. Construct the Work in phases, with each phase substantially complete as indicated on Drawings and as scheduled by Construction Manager.
  - B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule, showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.
- 1.6 WORK UNDER OWNER'S SEPARATE CONTRACTS
- A. Work with Separate Contractors: Cooperate fully with Owner's separate contractors, so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under Owner's separate contracts.
  - B. Preceding Work: Owner will award a separate contract for the following construction operations at Project site. Those operations may be substantially complete or may be partially conducted simultaneously with Work under this Contract.
    1. Abatement: Contract will include abatement and removal of hazardous substances prior to start of demolition in a given area.
  - C. Concurrent Work: Owner will award separate contract(s) for the following construction operations at Project site. Those operations will be conducted simultaneously with Work under this Contract.
    1. Audio/Visual: Audio/Visual equipment vendor will provide and install A/V equipment to be connected to terminations and rough-ins provided by Division 26 and 27 Contractors.
    2. Jail Security: Jail Security Electronics Contractor will provide and install terminal equipment to be connected to terminations and rough-ins provided by Division 26, 27 and 28 Contractors.
    3. Furniture: Furniture Contractor will provide and install furniture. Final connections to furniture shall be by Division 26 and 27 Contractors. Division 26 and 27 Contractors shall coordinate termination locations with furniture vendor.
- 1.7 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFICI) PRODUCTS
- A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:
    1. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.

2. Provide for delivery of Owner-furnished products to Project site.
  3. Upon delivery, inspect, with Contractor present, delivered items.
    - a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.
  4. Obtain manufacturer's inspections, service, and warranties.
  5. Inform Contractor of earliest available delivery date for Owner-furnished products.
- B. Contractor's Responsibilities: The Work includes the following, as applicable:
1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
  2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
  3. Receive, unload, handle, store, protect, and install Owner-furnished products.
  4. Make building services connections for Owner-furnished products.
  5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
  6. Repair or replace Owner-furnished products damaged following receipt.
- 1.8 OWNER-FURNISHED/OWNER-INSTALLED (OFOI) PRODUCTS
- A. The Owner will furnish and install products indicated in Drawings.
- 1.9 CONTRACTOR'S USE OF SITE AND PREMISES
- A. Restricted Use of Site: Each Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
    - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.
- 1.10 COORDINATION WITH OCCUPANTS
- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
  2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
  2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
  3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
  4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

#### 1.11 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to between 7:00 a.m. to 3:30 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
1. Notify Construction Manager not less than three work days in advance of proposed utility interruptions.
  2. Obtain Construction Manager's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
1. Notify Construction Manager not less than three work days in advance of proposed disruptive operations.
  2. Obtain Construction Manager's written permission before proceeding with disruptive operations.
- E. Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Owner's property is not permitted.
- F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- G. Employee Screening: Comply with Owner's requirements for background screening of Contractor personnel working on Project site.
1. Maintain list of approved screened personnel with Owner's representative.

#### 1.12 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:



1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
  3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
  4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
  3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.
- E. Contract Document Intent: The Contract Documents do not show all aspects or components of the Work. It is necessary for the Contractor, Sub-Contractors, Suppliers and Manufacturers to infer the presence of certain building components from the documents based on standard industry practices. Failure of a standard component to be detailed will not entitle the Contractor to a Change Order if the component is readily inferrable from the Contract Documents as a whole.
1. Resolve items requiring clarification as directed in Section 01 31 00 "Project Management and Coordination."

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION (Not Used)**

END OF SECTION

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## **SECTION 01 21 00 - ALLOWANCES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
  - 1. Lump-sum allowances.
- C. Related Requirements:
  - 1. Section 01 22 00 "Unit Prices" for procedures for using unit prices, including adjustment of quantity allowances when applicable.
  - 2. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

#### **1.3 DEFINITIONS**

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

#### **1.4 SELECTION AND PURCHASE**

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

#### **1.5 ACTION SUBMITTALS**

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

## 1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
  - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

## 1.8 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
  - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
  - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
  - 3. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
  - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
  - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

### 3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

### 3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Lump-Sum Allowance: Include the sum of \$35,000.00 for Section 07 24 19 EIFS installation, repairs, and infill.

1. This allowance includes material, receiving, handling, and installation costs, and Contractor overhead and profit.
- B. Allowance No. 2: Lump Sum Allowance: Include the sum of \$75,000.00 for Section 09 24 00 "Cement Plaster" for repairs and infill. This allowance is for unidentified repairs and infill only and does not include areas of new cement plaster ceiling as indicated in Reflected Ceiling Plans
  1. This allowance includes material, receiving, handling, and installation costs, and Contractor overhead and profit.
- C. Allowance No. 3: Quantity Allowance: Include 40 lineal feet of soffit enclosure system as specified in Section 05 59 63 "Detention Enclosures" in addition to areas identified on Drawings.
  1. This allowance includes material, receiving, handling, and installation costs, and Contractor overhead and profit.

END OF SECTION

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## **SECTION 01 22 00 - UNIT PRICES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
  - 1. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
  - 2. Section 01 40 00 "Quality Requirements" for field testing by an independent testing agency.

#### **1.3 DEFINITIONS**

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

#### **1.4 PROCEDURES**

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the Part 3 "Schedule of Unit Prices" Article contain requirements for materials described under each unit price.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### **3.1 SCHEDULE OF UNIT PRICES**

- A. Unit Price No. 1: Removal of unsatisfactory soil and replacement with satisfactory soil material.
  - 1. Description: Unsatisfactory soil excavation and disposal off-site, including all excavation, removal from the site, transportation and tipping costs and all other costs required for complete removal and disposal, and replacement with satisfactory fill material or engineered fill from off-site, as required, in accordance with Section 31 20 00 "Earth Moving."
  - 2. Unit of Measurement: Cubic yard of soil excavated, based on in-place surveys of volume before and after removal.

- B. Unit Price No. 2: Removal of unsatisfactory soil and replacement with satisfactory soil material.
1. Description: Unsatisfactory soil excavation and disposal off-site, including all excavation, removal from the site, transportation and tipping costs and all other costs required for complete removal and disposal, and replacement with lean mix concrete, as required, in accordance with Section 31 20 00 "Earth Moving."
  2. Unit of Measurement: Cubic yard (cubic meter) of soil excavated, based on in-place surveys of volume before and after removal.
- C. Unit Price No. 3: Cutting and patching of concrete slabs-on-grade.
1. Description: Cutting of new or existing concrete slabs-on-grade up to 6 inches thick, removal, disposal, and excavation as required, and subsequent backfill, compaction, and patching of concrete in accordance with Section 01 73 00 "Execution" not otherwise indicated in the Contract Documents.
  2. Unit of Measurement: square feet of concrete removed.
- D. Unit Price No. 4 - EIFS Repair and Infill:
1. Description: Repair, patching and infill of EIFS in accordance with Section 07 24 19 "Water-Drainage Exterior Insulation and Finish System (EIFS)."
  2. Unit of Measurement: Square foot.
  3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 21 00 "Allowances."
- E. Unit Price No. 5 - Plaster Patching:
1. Description: Incidental patching of plaster wall and ceiling in accordance with Section 09 24 00 "Cement Plastering."
  2. Unit of Measurement: Square Foot.
  3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 01 21 00 "Allowances."
- F. Unit Price No. 6: Provide 8x8 Chase Enclosure System.
1. Description: Provide cost to supply and install additional 8-inch by 8-inch Chase Enclosure System per Section 05 58 16.
  2. Unit of Measurement: Cost per lineal foot, installed.
  3. See Requirements under Section 01 21 00 "Allowances."

END OF SECTION



## **SECTION 01 23 00 - ALTERNATES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for alternates.

#### **1.3 DEFINITIONS**

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
  - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

#### **1.4 PROCEDURES**

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
  - 1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other Work of the Contract.
- C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION**

#### **3.1 SCHEDULE OF ALTERNATES**

- A. Performance and Payment Bond Alternate.
  - 1. Base Bid: Provide Performance and Payment Bond as required in Sections 00 21 13 "Instructions to Bidders" and 00 60 00 "Project Forms."
  - 2. Alternate: Do not provide Performance and Payment Bonds.
- B. Alternate No. 1: Green Roof and Roof Pavers.
  - 1. Base Bid: Do not provide Green Roof and Roof Pavers.
  - 2. Alternate: Provide Green Roof and Roof Pavers as indicated on Drawing A103A and as specified in Section 07 72 73 "Vegetated Roof Systems" and Section 07 76 00 "Roof Pavers."

- C. Alternate No. 2: Skylights.
1. Base Bid: Do not provide Skylights.
  2. Alternate: Provide Skylights as indicated on Drawings A103A and A103B and as specified in Section 08 63 00 "Metal-Framed Skylights."

END OF SECTION

## **SECTION 01 25 00 - SUBSTITUTION PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
  - 1. Document 002600 "Procurement Substitution Procedures" for requirements for substitution requests prior to award of Contract.
  - 2. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

#### **1.3 DEFINITIONS**

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

#### **1.4 ACTION SUBMITTALS**

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Substitution Request Form: Use form provided in Project Manual.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
    - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Samples, where applicable or requested.
    - f. Certificates and qualification data, where applicable or requested.
    - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.

- h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
  - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
  - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

#### 1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

#### 1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

#### 1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 30 days prior to time required for preparation and review of related submittals.
  - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Substitution request is fully documented and properly submitted.
    - c. Requested substitution will not adversely affect Contractor's construction schedule.
    - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - e. Requested substitution is compatible with other portions of the Work.
    - f. Requested substitution has been coordinated with other portions of the Work.
    - g. Requested substitution provides specified warranty.
    - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Except in the case of minor changes in the Work authorized by the Architect in accordance with Subparagraph 3.12.8 or Paragraph 7.4 of the General Conditions of the Contract for Construction (AIA Doc A201-2017), the Contractor may make substitutions only with the consent of the Owner, after evaluation by the A/E and in accordance with a Change Order or Construction Change Directive.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution does not require extensive revisions to the Contract Documents.
    - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - d. Substitution request is fully documented and properly submitted.
    - e. Requested substitution will not adversely affect Contractor's construction schedule.
    - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - g. Requested substitution is compatible with other portions of the Work.
    - h. Requested substitution has been coordinated with other portions of the Work.
    - i. Requested substitution provides specified warranty.
    - j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
  2. A request for a substitution for convenience constitutes a representation that Contractor:
    - a. Has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified.
    - b. Will provide the same warranties or bonds for the substitution as for the Product specified.
    - c. Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the work complete in all respects.
    - d. Waives all claims for additional costs, under Contractor's responsibility, which may subsequently become apparent.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

END OF SECTION

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# Substitution Request Form

To: Potter Lawson  
749 University Row, Suite 300  
Madison, WI 53705

Project: \_\_\_\_\_

Specified Item: \_\_\_\_\_

Section	Page	Paragraph	Description
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The undersigned requests consideration of the following:

Proposed Substitution: \_\_\_\_\_

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by:

Signature \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

Date \_\_\_\_\_

Phone/Fax \_\_\_\_\_

For use by the design consultant

☐ Accepted ☐ Accepted as noted

☐ Not Accepted ☐ Received too late

By \_\_\_\_\_

Date \_\_\_\_\_

Remarks \_\_\_\_\_

Attachments:

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## **SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
  - 1. Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
  - 2. Section 01 31 00 "Project Management and Coordination" for requirements for forms for contract modifications provided as part of web-based Project management software.

#### **1.3 CONSTRUCTION BULLETINS**

- A. Owner-Initiated Construction Bulletins: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Work Change Construction Bulletins issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within 14 days, when not otherwise specified, after receipt of Construction Bulletins, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.
    - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Construction Manager.
  - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - 4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

#### 1.4 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

#### 1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Construction Bulletin, Construction Manager will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

#### 1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
  1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

### **PART 2 - PRODUCTS (Not Used)**

### **PART 3 - EXECUTION (Not Used)**

END OF SECTION

## **SECTION 01 29 00 - PAYMENT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
  - 1. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

#### **1.3 DEFINITIONS**

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

#### **1.4 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
  - 1. Submit the schedule of values to Architect through Construction Manager at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 2. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
  - 1. Identification: Include the following Project identification on the schedule of values:
    - a. Project name and location.
    - b. Owner's name.
    - c. Owner's Project number.
    - d. Name of Architect.
    - e. Architect's Project number.
    - f. Contractor's name and address.
    - g. Date of submittal.
  - 2. Arrange schedule of values consistent with format of AIA Document G703.
  - 3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
    - a. Related Specification Section or division.
    - b. Description of the Work.
    - c. Name of subcontractor.
    - d. Name of manufacturer or fabricator.
    - e. Name of supplier.

- f. Change Orders (numbers) that affect value.
- g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
  - 1) Labor.
  - 2) Materials.
  - 3) Equipment.
- 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
- 5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site.
- 6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
- 7. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
- 8. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
- 9. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

#### 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and Construction Manager and paid for by Owner.
- B. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
  - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
  - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
  - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- D. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
  - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
  - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

3. Provide summary documentation for stored materials indicating the following:
  - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
  - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
  - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
  - d. Location of stored materials.
  - e. Photographic documentation showing storage conditions of materials.
  - f. Photographic documentation showing that stored materials are labelled "Property of Jefferson County."
- E. Transmittal: Submit signed and notarized copies of each Application for Payment to Architect by email.
  1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  1. List of subcontractors.
  2. Schedule of values.
  3. Contractor's construction schedule (preliminary if not final).
  4. Submittal schedule (preliminary if not final).
  5. List of Contractor's staff assignments.
  6. Certificates of insurance and insurance policies.
  7. Performance and payment bonds.
  8. Data needed to acquire Owner's insurance.
- G. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
    - a. Complete administrative actions, submittals, and Work preceding this application, as described in Section 01 77 00 "Closeout Procedures."
  2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- H. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
  1. Evidence of completion of Project closeout requirements.
  2. Certification of completion of final punch list items.
  3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  4. Updated final statement, accounting for final changes to the Contract Sum.
  5. AIA Document G706.
  6. AIA Document G706A.
  7. AIA Document G707.
  8. Evidence that claims have been settled.
  9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
  10. Waivers and releases.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

END OF SECTION

## **SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
  - 1. General coordination procedures.
  - 2. Coordination drawings.
  - 3. RFIs.
  - 4. Digital project management procedures.
  - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
  - 1. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
  - 2. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  - 3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

#### **1.3 DEFINITIONS**

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
  - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
  - 2. Number and title of related Specification Section(s) covered by subcontract.
  - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
  - 1. Post copies of list in Project meeting room, in temporary field office, and in prominent location in built facility. Keep list current at all times.

## 1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Coordination of Multiple Contracts: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its own operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair. Afford all other trades every reasonable opportunity for the installation of their work and for the storage of their material. In no case exclude from the premises or work, any other Subcontractor or their employees; or interfere with any other Subcontractor in the execution or installation of its Work.
  - 3. Perform your Work in proper sequence in relation to that of other trades. Pay all costs caused by defective or ill-timed Work.
  - 4. Arrange your Work and dispose of your materials so as not to interfere with the Work or storage of materials of other Subcontractors and join your work to that of others in accordance with the intent of the Drawings and Specifications.
  - 5. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's construction schedule.
  - 2. Preparation of the schedule of values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Preinstallation conferences.
  - 7. Project closeout activities.
  - 8. Startup and adjustment of systems.



## 1.6 EXAMINATION OF DRAWINGS

- A. Examine all Drawings together with the Specifications applicable to all Contracts. See Section 01 10 00 - Summary.
- B. The Drawings show the general arrangement, quantity, extent, and location of the Work of the Project. This arrangement and location may be modified to make portions of the Work fit together.
- C. After examination of the Contract Documents, bring to the attention of the A/E any questions with regard to the intent of these Documents, in a timely manner, prior to commencing with the Work.
- D. Also notify the A/E and Owner of any unforeseen conditions found in the field, including conflict in the arrangement and location of piping, conduits, ductwork, etc.
- E. Sprinkler Head Locations:
  - 1. Sprinkler heads are not necessarily indicated on the Drawings although some heads may be indicated on reflected ceiling plans. Locate heads in symmetrical patterns. Coordinate with other trades that require ceiling mounted or ceiling penetrated products. Center heads in acoustical ceiling panels and tiles. When heads are located in ceilings other than acoustical panels or tiles the heads shall be located in a straight line.

## 1.7 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
  - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
    - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
    - b. Coordinate the addition of trade-specific information to coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
    - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
    - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
    - f. Indicate required installation sequences.
    - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
  - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
  - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
  - c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
  - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
  - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
  - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
  - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
  - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Architect may review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."

C. Coordination Drawing Process: Prepare coordination drawings in the following manner:

1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
4. Fire Sprinkler Installer will locate piping and equipment, using red color. Fire Sprinkler Installer shall forward drawing files to Electrical Installer.
5. Electrical Installer will indicate service and feeder conduit runs and equipment in green color. Electrical Installer shall forward drawing files to Communications and Electronic Safety and Security Installer.

6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment in purple color. Communications and Electronic Safety and Security Installer shall forward completed drawing files to Contractor.
7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.

#### 1.8 INSTALLATION AND ARRANGEMENT

- A. Install all Work to permit removal (without damage to other parts) of coils, heat exchanger bundles, boiler tubes, fan shafts and wheels, filters, belt guards, sheaves and drives, and all other parts requiring periodic replacement or maintenance.
- B. Arrange electrical raceways, pipes, ducts, and equipment to permit ready access to valves, cocks, traps, starters, motors, control components and to clear the openings of swinging and overhead doors, and access panels.
- C. Coordinate opening locations with Prime Contractor.
- D. Adjustments in Locations:
  1. Adjust locations of pipes, ducts, electrical raceways, switches, panels, equipment, fixtures, etc., as may be required to accommodate work interferences.
- E. Prior to fabrication, determine routes and locations of electrical raceways, pipes, and ducts.
- F. Right-of-Way: Lines which pitch shall have right-of-way over those which do not pitch. For example: Condensate and plumbing drains shall normally have right-of-way. Lines whose elevations cannot be changed shall have right-of-way over lines whose elevations can be changed.
- G. Make offset transition and changes in direction in electrical raceways, pipes, and ducts as required to maintain headroom and pitch of sloping lines.
- H. Provide all traps, air vents, sanitary vents, etc., as required to affect these offsets, transitions and changes in direction.
- I. Access Panels: Where required for access to your Work in otherwise inaccessible space, each Subcontractor shall furnish access panel, sized for purpose intended, suitable for location installed, to Prime Contractor for installation by the trade in whose work panel is required. Verify size, type, and location with A/E prior to furnishing. Provide as specified in Divisions 21, 22, 23 and 26.
- J. Ductwork: Change the cross-sectional dimensions of ductwork when required to meet job conditions, but maintain at least the same velocity and pressure drop for the new cross-sectional area. Secure the approval of A/E prior to fabrication of ductwork requiring such changes.

#### 1.9 EQUIPMENT CONNECTIONS

- A. General: Equipment arrangements and connections shown on the Drawings are based upon the particular manufacturer as noted on the Drawings or in the Specifications. In some cases if so specified, other equivalent equipment may be furnished at the Contractor's option.
- B. Where such equipment requiring different arrangement or connections from those shown is used, install the equipment to operate and function with the intent of the system design. When requested by the A/E, submit drawings showing the proposed revised installation.
- C. If the proposed installation is approved, make all incidental changes in piping, ductwork, supports, insulation, wiring heaters, panelboards, etc. Provide any additional motors, controllers, valves, fittings, and other additional equipment required for the proper operation of the system resulting from selection of equipment.

- D. Notify all other Contractors who may be affected in a timely manner, and provide for any additional costs which may be caused by different arrangement or connection.
- E. It is the responsibility of Division 14, 21, 22 and 23 Contractors to review and understand the Electrical Drawings and Specifications with regard to equipment connections for equipment provided by each of these respective Contractors. Electrical characteristics indicated in Division 26, 27 and 28 Specifications and Drawings are based on the Basis-of-Design equipment specified in Divisions 14, 21, 22 and 23 and are an integral part of the respective equipment specifications. Specification requirements in Divisions 14, 21, 22 and 23 shall take precedence over the electrical requirements if the manufacturer cannot meet all requirements; however, if a Contractor submits equipment with different electrical characteristics than indicated on the Drawings and Specifications, the respective Contractor is responsible for all electrical coordination, redesign and costs associated with the submittal. Approved submittals with different electrical requirements than indicated on the Electrical Drawings and Specifications are subject to the same requirements as listed above, whether noted on the submittal review comments or not.
- F. The following list, in descending order, is the precedence assigned the work items for space priority. Gravity flow requirements for plumbing waste and roof drainage has first priority, recessed light fixtures and space for their installation has second priority, ductwork, third priority, etc.
  - 1. Plumbing waste and roof drainage.
  - 2. Recessed light fixtures.
  - 3. Ductwork and appurtenances.
  - 4. Fire suppression (sprinkler systems).
  - 5. HVAC and steam piping.
  - 6. Plumbing vent and water supply.
  - 7. Electrical, communication, and electronic safety and security conduit.

#### 1.10 SELECTED SPECIFIC DUTIES

- A. Plumbing Subcontractor (PC):
  - 1. Make final connections to the Work of fire/water, storm, and sanitary utility contractors.
- B. HVAC Subcontractor (HC):
  - 1. Make gas connections to equipment furnished by other Subcontractors.
  - 2. Provide all external control wiring for your equipment unless provided otherwise in the Contract Documents. Coordinate opening locations with Prime Contractor.
- C. Electrical Subcontractor (EC):
  - 1. Provide all wiring to motor operated equipment and motor control centers furnished by other Subcontractors, and make final connections unless provided otherwise in the Contract Documents.
  - 2. Provide motor starters and disconnects unless integral with equipment. Size motor starters to equipment provided. Also, provide required accessories.
  - 3. Provide final line voltage (110V and greater) to motors; provide heaters, check amperage draw, and check motor rotation.
- D. All Subcontractors Except EC:
  - 1. Provide wiring diagrams of all motorized equipment and deliver to EC. Prepare diagrams for the specific equipment installation.

#### 1.11 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
  - 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
  - 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
  - 1. Project name.
  - 2. Owner name.
  - 3. Owner's Project number.
  - 4. Name of Architect and Construction Manager.
  - 5. Architect's Project number.
  - 6. Date.
  - 7. Name of Contractor.
  - 8. RFI number, numbered sequentially.
  - 9. RFI subject.
  - 10. Specification Section number and title and related paragraphs, as appropriate.
  - 11. Drawing number and detail references, as appropriate.
  - 12. Field dimensions and conditions, as appropriate.
  - 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  - 14. Contractor's signature.
  - 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
  - 1. Attachments shall be electronic files in PDF format.
- D. Architect's and Construction Manager's Action: Architect and Construction Manager will review each RFI, determine action required, and respond. RFIs received by Architect or Construction Manager after 1:00 p.m. will be considered as received the following working day.
  - 1. The following Contractor-generated RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for approval of Contractor's means and methods.
    - d. Requests for coordination information already indicated in the Contract Documents.
    - e. Requests for adjustments in the Contract Time or the Contract Sum.
    - f. Requests for interpretation of Architect's actions on submittals.
    - g. Incomplete RFIs or inaccurately prepared RFIs.
  - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect or Construction Manager of additional information.

3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
  - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Construction Manager in writing within 5 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at Progress Meetings. Include the following:
  1. Project name.
  2. Name and address of Contractor.
  3. Name of Architect and Construction Manager.
  4. RFI number, including RFIs that were returned without action or withdrawn.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Architect's and Construction Manager's response was received.
- F. On receipt of Architect's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Construction Manager within seven days if Contractor disagrees with response.

#### 1.12 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model can be provided by Architect for Contractor's use during construction.
  1. Digital data files may be used by Contractor in preparing coordination drawings and Project Record Drawings.
  2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
  3. Digital Drawing Software Program: Contract Drawings are available in Revit.
  4. Contractor shall execute a data licensing agreement in the form of Agreement included in Project Manual.
    - a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of Agreement included in this Project Manual.
- B. Web-Based Project Management Software Package: Use Construction Manager's web-based Project management software package for purposes of hosting and managing Project communication and documentation until Final Completion.
  1. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
- C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
  1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  2. Name file with submittal number or other unique identifier, including revision identifier.
  3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

#### 1.13 PROJECT MEETINGS

- A. General: Construction Manager will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within five days of the meeting.
- B. Preconstruction Conference: Construction Manager will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days prior to the commencement of the Work.
1. Attendees: Authorized representatives of Owner , Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Responsibilities and personnel assignments.
    - b. Tentative construction schedule.
    - c. Phasing.
    - d. Critical work sequencing and long lead items.
    - e. Designation of key personnel and their duties.
    - f. Lines of communications.
    - g. Use of web-based Project software.
    - h. Procedures for processing field decisions and Change Orders.
    - i. Procedures for RFIs.
    - j. Procedures for testing and inspecting.
    - k. Procedures for processing Applications for Payment.
    - l. Distribution of the Contract Documents.
    - m. Submittal procedures.
    - n. Preparation of Record Documents.
    - o. Use of the premises and existing building.
    - p. Work restrictions.
    - q. Working hours.
    - r. Owner's occupancy requirements.
    - s. Responsibility for temporary facilities and controls.
    - t. Procedures for moisture and mold control.
    - u. Procedures for disruptions and shutdowns.
    - v. Construction waste management and recycling.
    - w. Parking availability.
    - x. Office, work, and storage areas.
    - y. Equipment deliveries and priorities.
    - z. First aid.
    - aa. Security.
    - bb. Progress cleaning.
  3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, Construction Manager of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility requirements.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written instructions.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. Protection of construction and personnel.
  3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Construction Manager will schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
  2. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    - a. Preparation of Record Documents.
    - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    - c. Procedures for completing and archiving web-based Project software site data files.
    - d. Submittal of written warranties.
    - e. Requirements for completing sustainable design documentation.
    - f. Requirements for preparing operations and maintenance data.
    - g. Requirements for delivery of material samples, attic stock, and spare parts.



- h. Requirements for demonstration and training.
  - i. Preparation of Contractor's punch list.
  - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
  - k. Submittal procedures.
  - l. Coordination of separate contracts.
  - m. Owner's partial occupancy requirements.
  - n. Installation of Owner's furniture, fixtures, and equipment.
  - o. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Construction Manager will conduct progress meetings at biweekly intervals.
- 1. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Resolution of BIM component conflicts.
      - 4) Status of submittals.
      - 5) Deliveries.
      - 6) Off-site fabrication.
      - 7) Access.
      - 8) Site use.
      - 9) Temporary facilities and controls.
      - 10) Progress cleaning.
      - 11) Quality and work standards.
      - 12) Status of correction of deficient items.
      - 13) Field observations.
      - 14) Status of RFIs.
      - 15) Status of Proposal Requests.
      - 16) Pending changes.
      - 17) Status of Change Orders.
      - 18) Pending claims and disputes.
      - 19) Documentation of information for payment requests.
  - 3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
    - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

- F. Coordination Meetings: Construction Manager will conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Construction Manager, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    - c. Review present and future needs of each contractor present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Resolution of BIM component conflicts.
      - 4) Status of submittals.
      - 5) Deliveries.
      - 6) Off-site fabrication.
      - 7) Access.
      - 8) Site use.
      - 9) Temporary facilities and controls.
      - 10) Work hours.
      - 11) Hazards and risks.
      - 12) Progress cleaning.
      - 13) Quality and work standards.
      - 14) Status of RFIs.
      - 15) Proposal Requests.
      - 16) Change Orders.
      - 17) Pending changes.
  3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

END OF SECTION



**ELECTRONIC FILE DISCLAIMER, RELEASE AND LIMITATION OF LIABILITY AGREEMENT**

**Project Number:** 2020.01.00      **Project Name:** Jefferson County Courthouse and Sheriff's Building

The information contained on the electronic files for the above listed project was created by Potter Lawson Inc. (the Architect), and its subconsultant(s), Design Engineers, P.C., IMEG Corporation, and Point of Beginning, Inc., collectively Potter Lawson. By signing below, the Contractor acknowledges and agrees to the terms for Delivery of Electronic Files as stated below:

**Delivery of Electronic Files**

(1) In accepting and utilizing any drawings, Model(s), reports and data or any form of electronic media generated and furnished by the Architect, the Contractor agrees that all such electronic files are instruments of service of the Architect and the Architect's consultants, who shall be deemed the author, and shall retain all common law, statutory law and other rights, without limitation, including copyrights, except as set forth in Article 7 of the Standard Form of Agreement Between Owner and Architect, AIA Document B101 - 2017, as amended.

(2) The Contractor agrees not to reuse these electronic files, in whole or in part, for any purposes other than for this Project. The Contractor agrees not to transfer these electronic files to others outside of the Project Team (Owner and Owner's Consultants, Construction Manager, Contractor and appropriate Subcontractor(s)) without the prior written consent of the Architect. The Contractor further agrees to waive all claims against the Architect and the Architect's consultants resulting in any way from any unauthorized changes to or reuse of the electronic files for any other project by anyone other than the Architect.

(3) The Contractor is aware that differences may exist between the electronic files delivered and the printed hard-copy construction documents. In the event of a conflict between electronic files and the signed Construction Documents and hard-copy addendum(s) prepared by the Architect, the signed, sealed or hard-copy Construction Documents and addendum(s) shall govern.

(4) In addition, the Contractor agrees, to the fullest extent permitted by law, to indemnify and hold harmless the Architect, its officers, directors, employees and sub consultants (collectively, Architect) against all damages, liabilities or costs, including reasonable attorneys' fees and defense costs, arising from User's modifications to the files not authorized by the Architect, or the User's unlicensed use of such files. Nothing in this section shall obligate one party to indemnify another party against its own negligence or intentional wrongdoing.

(5) Under no circumstances shall delivery of electronic files for use by the Contractor or others be deemed a sale by the Architect. In no event shall the Architect be liable for indirect or consequential damages as a result of the Contractor's or others use or reuse of the electronic files.

(6) The Contractor shall include this provision in its contract with its Sub-Contractors and Consultants.

The following electronic files are requested: \_\_\_\_\_

**AGREED**

**I have read, understand and agree to this Disclaimer/Release/Limitation of Liability, and I am authorized by the receiver named below to execute this agreement on its behalf.**

**Company (Receiver):** \_\_\_\_\_

**Print Name of Owner  
or Corporate  
Officer(Receiver):** \_\_\_\_\_

**Signature & Date:** \_\_\_\_\_

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## **SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Startup construction schedule.
  - 2. Contractor's Construction Schedule.
  - 3. Construction schedule updating reports.
  - 4. Daily construction reports.
  - 5. Material location reports.
  - 6. Unusual event reports.
- B. Related Requirements:
  - 1. Section 01 40 00 "Quality Requirements" for schedule of tests and inspections.
  - 2. Section 01 29 00 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.

#### **1.3 DEFINITIONS**

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
  - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- C. Event: The starting or ending point of an activity.
- D. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Format for Submittals: Submit required submittals in the following format:
  - 1. Working electronic copy of schedule file.
  - 2. PDF file.
- B. Startup construction schedule.

1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
  - C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
    1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
  - D. Construction Schedule Updating Reports: Submit with Applications for Payment.
  - E. Daily Construction Reports: Submit at monthly intervals.
  - F. Unusual Event Reports: Submit at time of unusual event.
  - G. Qualification Data: For scheduling consultant.
- 1.5 COORDINATION
- A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
    1. Secure time commitments for performing critical elements of the Work from entities involved.
    2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.
- 1.6 CONTRACTOR'S CONSTRUCTION SCHEDULE
- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
  - B. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting, using CPM scheduling.
    1. In-House Option: Owner may waive requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
    2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
  - C. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.
    1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
  - D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
    1. Temporary Facilities: Indicate start and completion dates for the following as applicable:
      - a. Securing of approvals and permits required for performance of the Work.
      - b. Temporary facilities.
      - c. Construction of mock-ups, prototypes and samples.
      - d. Owner interfaces and furnishing of items.
      - e. Interfaces with Separate Contracts.
      - f. Regulatory agency approvals.
      - g. Punch list.
    2. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
    3. Startup and Testing Time: Include no fewer than 15 days for startup and testing.

4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Construction Manager's administrative procedures necessary for certification of Substantial Completion.
  5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
  2. Work under More Than One Contract: Include a separate activity for each contract.
  3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  6. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Substantial Completion.
    - e. Use-of-premises restrictions.
    - f. Provisions for future construction.
    - g. Seasonal variations.
    - h. Environmental control.
  7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
    - a. Mockups.
    - b. Fabrication.
    - c. Installation.
    - d. Tests and inspections.
    - e. Curing.
    - f. Startup and placement into final use and operation.
    - g. Commissioning.
  8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
    - a. Structural completion.
    - b. Temporary enclosure and space conditioning.
    - c. Permanent space enclosure.
    - d. Completion of mechanical installation.
    - e. Completion of electrical installation.
    - f. Substantial Completion.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- G. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
1. See Section 01 29 00 "Payment Procedures" for cost reporting and payment procedures.

- H. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
  2. Unanswered Requests for Information.
  3. Rejected or unreturned submittals.
  4. Notations on returned submittals.
  5. Pending modifications affecting the Work and the Contract Time.
- I. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  3. As the Work progresses, indicate Final Completion percentage for each activity.
- J. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- K. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
  2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

#### 1.7 GANTT-CHART SCHEDULE REQUIREMENTS

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for commencement of the Work.
1. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

#### 1.8 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
  2. List of separate contractors at Project site.
  3. Approximate count of personnel at Project site.
  4. Equipment at Project site.
  5. Material deliveries.
  6. High and low temperatures and general weather conditions, including presence of rain or snow.
  7. Testing and inspection.
  8. Accidents.



9. Meetings and significant decisions.
  10. Unusual events.
  11. Stoppages, delays, shortages, and losses.
  12. Meter readings and similar recordings.
  13. Emergency procedures.
  14. Orders and requests of authorities having jurisdiction.
  15. Change Orders received and implemented.
  16. Construction Change Directives received and implemented.
  17. Services connected and disconnected.
  18. Equipment or system tests and startups.
  19. Partial completions and occupancies.
  20. Substantial Completions authorized.
- B. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
1. Submit unusual event reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence, Architect, and Owner.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

END OF SECTION

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## **SECTION 01 33 00 - SUBMITTAL PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Submittal schedule requirements.
  - 2. Administrative and procedural requirements for submittals.
- B. Related Requirements:
  - 1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
  - 2. Section 01 31 00 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
  - 3. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
  - 4. Section 01 40 00 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
  - 5. Section 01 77 00 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
  - 6. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 7. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
  - 8. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

#### **1.3 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for the portions of the Work for which the Contract Documents require submittals. Review by the A/E is subject to the limitations of this Section. Informational submittals upon which the A/E is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned without action.

#### 1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  2. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
  3. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal Category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's and Construction Manager's final release or approval.
    - g. Scheduled dates for purchasing.
    - h. Scheduled date of fabrication.
    - i. Scheduled dates for installation.
    - j. Activity or event number.

#### 1.5 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
  2. Date.
  3. Name of Architect.
  4. Name of Construction Manager.
  5. Name of firm or entity that prepared submittal.
  6. Names of subcontractor, manufacturer, and supplier.
  7. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
  8. Unique submittal number, including revision identifier.
  9. Submittal purpose and description.
  10. Drawing number and detail references, as appropriate.
  11. Indication of full or partial submittal.
  12. Location(s) where product is to be installed, finish codes, or keynotes identifiers, as appropriate.
  13. Other necessary identification.
  14. Remarks.
- B. Options: Identify options requiring selection by Architect.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect and Construction Manager on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

- D. Physical Submittals:
1. Physical submittals shall be utilized for physical sample submittals.
  2. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
  3. Additional Copies: Unless additional copies are required for final submittal, and unless Architect or Construction Manager observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
  4. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form containing the information noted above.
- E. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
- F. Submittals requiring selection of colors, textures, or other physical attributes shall be sent as physical submittals and shall not be submitted via digital means. Digital submittals requiring such selections will be returned without action.

## 1.6 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Email: Prepare submittals up to 10 MB in size as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
    - a. Architect, through Construction Manager, will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
  2. Web-Based Project Management Software: Prepare submittals exceeding 10 MB in PDF form, and provide to Construction Manager for upload to Architect's web-based Newforma Project Center project management software website. Contact A/E to request access. Enter required data in web-based software site to fully identify submittal.
  3. Paper: Prepare submittals in paper form and deliver to Architect.
  4. The A/E shall not be required to utilize Contractor's web-based project management, submittal or RFI software.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
    - a. Architect and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Review Time: Allow 15 days for review of each submittal, including resubmittals. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block, and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked with approval notation from Architect's and Construction Manager's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's and Construction Manager's action stamp.

#### 1.7 SUBMITTAL REQUIREMENTS

- A. Contractor shall review for compliance with the Contract Documents, approve and submit to the A/E Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the A/E or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals that are not marked as reviewed for compliance with the Contract Documents and approved by Contractor will be returned by A/E without action.
- B. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and A/E that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work, the Project, and the Contract Documents.
- C. Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been reviewed by the A/E.
- D. The Work shall be in accordance with approved submittals except that Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by A/E's approval of Shop Drawings, Product Data, Samples or similar submittals unless Contractor has specifically informed A/E in writing of such deviation at the time of submittal and (1) A/E has given written approval to the specific deviation as a Minor Change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by A/E's approval thereof.
- E. Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by A/E on previous submittals. In the absence of such written notice, A/E's approval of a resubmission shall not apply to such revisions.
- F. Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless Contractor needs to provide such services in order to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures.

- G. Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and A/E will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such design professional.
- H. Shop Drawings and other submittals related to the Work designed or certified by such professionals, if prepared by others, shall bear such professional's written approval when submitted to A/E. The Owner and A/E shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and A/E have specified to the Contractor all performance and design criteria that such services must satisfy. In accordance with the above, A/E will review, approve or take other appropriate action on such submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.
- I. A/E will review and approve, or take other appropriate action upon, Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The A/E's action will be taken in accordance with the submittal schedule approved by the A/E or, in absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the A/E's professional judgment to permit adequate review by A/E or its consultants as applicable. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of Contractor as required by the Contract Documents. The A/E's review of the Contractor's submittals shall not relieve Contractor of the obligations under Paragraphs 3.10, 3.11, and 3.12 of the General Conditions of the Contract for Construction (AIA Doc A201-2017), and this Section 01 33 00 of the Specifications. The A/E's review shall not constitute approval of safety precautions or, of any construction means, methods, techniques, sequences or procedures. The A/E's approval of a specific item shall not indicate approval of an assembly of which the item is a component.
- J. A/E will review a single submittal and one resubmittal. Should additional resubmittals be required due to Contractor's failure to prepare a resubmittal in accordance with previously reviewed submittals or should Contractor fail to perform the obligations of Subparagraphs 3.2.2 and 3.2.3 of the General Conditions of the Contract for Construction (AIA Doc A201-2017) in the preparation of a correct resubmittal, Contractor shall pay such costs and damages to Owner as would have been avoided if Contractor had performed such obligations.
- K. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each copy of each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.

- f. Application of testing agency labels and seals.
  - g. Notation of coordination requirements.
  - h. Availability and delivery time information.
- 4. For equipment, include the following in addition to the above, as applicable:
  - a. Wiring diagrams that show factory-installed wiring.
  - b. Printed performance curves.
  - c. Operational range diagrams.
  - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
- 5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
- L. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
  - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
- M. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
  - 1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
  - 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
    - a. Project name and submittal number.
    - b. Generic description of Sample.
    - c. Product name and name of manufacturer.
    - d. Sample source.
    - e. Number and title of applicable Specification Section.
    - f. Specification paragraph number and generic name of each item.
  - 3. Paper Transmittal: Include paper transmittal, including complete submittal information indicated.
  - 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
  - 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit three full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return submittal with options selected.



6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
  - a. Number of Samples: Submit three sets of Samples unless specified otherwise, or additional samples are required for the submitting Contractor's use. Architect and Construction Manager will retain one Sample set; remainder will be returned. Construction Manager shall mark up and retain one returned Sample set as a project record Sample.
    - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
    - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least threesets of paired units that show approximate limits of variations.
- N. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
- O. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- P. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- Q. Certificates:
  1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
  2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
  3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
  4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
  5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
  6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.

R. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
  - a. Name of evaluation organization.
  - b. Date of evaluation.
  - c. Time period when report is in effect.
  - d. Product and manufacturers' names.
  - e. Description of product.
  - f. Test procedures and results.
  - g. Limitations of use.

1.8 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect and Construction Manager.

- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Architect and Construction Manager will not review submittals received from Contractor that do not have Contractor's review and approval.

#### 1.10 ARCHITECT'S AND CONSTRUCTION MANAGER'S REVIEW

- A. Submittals: Architect and Construction Manager will review each submittal, indicate corrections or revisions required, and return.

1. Submittals: Architect and Construction Manager will indicate, via markup on each submittal, the appropriate action, as follows:

- a. Reviewed Positive: Architect has no additional comments and Contractor may proceed.
- b. Reviewed Positive as Noted: Architect has added comments or revisions to the submittal and Contractor may proceed as noted.
- c. Revise and Resubmit: Revise submittal as noted by Architect and resubmit. Contractor may not proceed prior to resubmittal.
- d. Partial Resubmittal: Resubmit those parts noted by Architect. Contractor may proceed with portions of the Work not noted for resubmittal.
- e. Reviewed Only: Informational submittal not requiring Architect's action. Contractor may proceed in compliance with the Contract Documents.
- f. No Action Taken: Submittal was not requested by Architect. Contractor may proceed in compliance with the Contract Documents.
- g. Reviewed Negative: Submittal is not in compliance with the Contract Documents and requires significant changes. Contractor may not proceed prior to a positive submittal.

- B. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.

- C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

- D. Architect and Construction Manager will return without review submittals received from sources other than Contractor.

- E. Submittals not required by the Contract Documents will be returned by Architect without action.

#### **PART 2 - PRODUCTS (Not Used)**

#### **PART 3 - EXECUTION (Not Used)**

END OF SECTION

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## **SECTION 01 35 13.16 - SPECIAL PROJECT PROCEDURES FOR DETENTION FACILITIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes special procedures for coordination of detention work.
- B. Detention work required by, but not specified in, this Section includes the following:
  - 1. Section 05 05 53 "Security Metal Fastenings."
  - 2. Section 05 58 16 "Formed Metal Enclosures."
  - 3. Section 07 92 16.13 "Security Joint Sealants."
  - 4. Section 08 31 13.53 "Security Access Doors and Frames."
  - 5. Section 08 34 63 "Detention Doors and Frames."
  - 6. Section 08 71 63 "Detention Door Hardware."
  - 7. Section 08 88 53 "Security Glazing."
  - 8. Section 09 57 53 "Security Ceiling Assemblies."
  - 9. Section 09 84 33.13 "Detention Sound-Absorbing Wall Units."
  - 10. Section 10 28 13.63 "Detention Toilet Accessories."
  - 11. Section 11 98 00 "Detention Equipment."
  - 12. Section 11 98 19 "Detention Room Padding."
  - 13. Section 12 36 16.13 "Detention Metal Countertops."
  - 14. Section 12 55 00 "Detention Furniture."

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Prepare and submit Project-specific coordination drawings, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved. Address the following, as applicable:
  - 1. See individual Sections for specific coordination drawing requirements for products and equipment.
  - 2. Show relationship of components indicated on separate Shop Drawings.
  - 3. Show dimensions and clearances of interrelated detention work.
  - 4. Provide templates and patterns.
  - 5. Indicate required operation sequences of interrelated detention work.
  - 6. Indicate required installation sequences.
  - 7. Include information necessary for interface with other trades and building components.
  - 8. See special construction, mechanical, plumbing, electrical, communications, and electronic safety and security Sections for specific coordination drawing requirements for required installations.
- B. Qualification Data: For qualified Detention Equipment Contractor (DEC) to demonstrate capabilities and experience. Include list of completed projects with project names and addresses; names, addresses, and telephone numbers of architects, owners, and contractors; and date of occupancy by Owner.
- C. Examination reports, documenting inspections of substrates, areas, and conditions.
- D. Anchor inspection reports, documenting inspections of built-in and cast-in anchors.
- E. Field quality-control reports.

- F. Field quality-control certification, signed by Contractor and Detention Equipment Contractor.

#### 1.4 QUALITY ASSURANCE

- A. Detention Equipment Contractor Qualifications: An experienced installer of detention products and equipment who has completed detention work installations similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.
  - 1. Pre-qualification: Detention Equipment Contractors not listed under "Providers" shall require pre-qualification prior to submitting bids. DEC's seeking pre-approval shall contact the Construction Manager minimum 15 working days prior to bid to coordinate approvals.
  - 2. Bonding Capacity: Qualified Detention Equipment Contractors shall be capable of providing a Performance Bond, and separate Labor and Material Payment Bond based on the full value of their bid.
  - 3. Experience: No fewer than five completed detention projects (jails or prisons) that have been in operation for a minimum of five years.
    - a. Experienced in administration and supervision of detention work, including mechanical and electrical detention work, and integration of its various components.

#### 1.5 DETENTION EQUIPMENT CONTRACTOR

- A. Providers: Subject to compliance with requirements, the following Detention Equipment Contractors are pre-approved:
  - 1. CML Security, Erie, CO
  - 2. Cornerstone Detention Products, Inc., Madison, AL
  - 3. Pauly Jail Building Company, Inc., Noblesville, IN
  - 4. Southern Folger Detention Equipment Company, San Antonio, TX
  - 5. Stronghold Industries, Racine, WI
  - 6. Sweeper Metal Fabricators Corp., Drumright, OK
  - 7. Valley Security, Elgin, IL
- B. Responsibilities:
  - 1. Detention work coordination.
  - 2. Administrative procedures.
  - 3. Examination.
  - 4. Field quality control.
  - 5. Demonstration.

#### 1.6 DETENTION WORK COORDINATION

- A. Coordinate detention work to ensure efficient and orderly installation and proper operation of each part of detention work. Coordinate detention work that depends on separate entities for proper installation, connection, and operation.
  - 1. Develop special procedures required for coordination of detention work.
  - 2. Coordinate installation of different detention components to ensure maximum accessibility for required maintenance, service, and repair.
- B. Coordinate selection of detention products and equipment and ensure compatibility.
- C. Verify qualifications of detention lock Installer and detention monitoring and control Installer specified in other Sections.
- D. Coordinate installation of products furnished by Owner.

- E. Assemble and coordinate Shop Drawings, work submittals, and applicable coordination drawings for detention work provided by separate entities responsible for detention work. Submit all submittal items required for each Detention Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  - F. Detention Work Subschedule: Coordinate sequencing and scheduling of detention work. Prepare a subschedule to Construction Manager's Construction Schedule for detention work. Base subschedule on preliminary construction schedule. Secure time commitments for performing critical construction activities from separate entities responsible for detention work.
    - 1. Schedule construction operations in sequence required to obtain best results where installation of one part of detention work depends on installation of other components, before or after its own installation.
    - 2. Coordinate sequence of detention work activities to accommodate tests and inspections.
  - G. Coordinate installation of anchorages and embedments for detention work. Obtain and distribute, to parties involved, setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
  - H. Coordinate type of security fasteners for detention work so no more than two different sets of tools are required to operate security fasteners for entire Project. Coordinate submittal of extra fasteners and tools for maintenance material submittals.
  - I. Check Shop Drawings of other related work to verify that adequate provisions are made for locating and installing detention work to comply with indicated requirements.
  - J. Coordinate temporary facilities and controls required by detention work.
  - K. Coordinate, schedule, and approve interruptions of existing utilities related to maintaining existing levels of security, including those necessary to make connections for temporary services.
    - 1. Provide information necessary to adjust, move, or relocate existing detention utility structures affected by detention work.
    - 2. Locate connection points to existing detention utility systems.
  - L. Coordinate protection of detention work.
  - M. Coordinate preparation of Project Record Documents for detention work and integrate information from entities responsible for detention work to form one combined record.
  - N. Coordinate preparation of operation and maintenance manuals for detention work and integrate information from entities responsible for detention work to form one combined record.
- 1.7 ADMINISTRATIVE PROCEDURES
- A. Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of detention work. Such administrative activities include, but are not limited to, the following:
    - 1. Preparation of detention work subschedule for Construction Manager's Construction Schedule.
    - 2. Installation and removal of temporary facilities and controls for detention work.
    - 3. Delivery and processing of detention work submittals.
    - 4. Preinstallation conferences for detention work.
    - 5. Project closeout activities for detention work.

- B. Notifications: Prepare memoranda for distribution to each party involved with detention work, outlining special procedures required for coordination of detention work. Include such items as required notices, reports, and attendance at meetings.
- C. Coordination Meetings: Conduct coordination meetings specifically for detention work at regular intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
  - 1. Attendees: In addition to representatives of Owner, Construction Manager, Architect, and Contractor, each subcontractor, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of detention work activities shall be represented at these meetings. All participants at meetings shall be familiar with Project and authorized to conclude matters relating to detention work.
  - 2. Agenda: Review and correct or approve minutes of previous detention work coordination meetings. Review other items of significance that could affect progress of detention work. Include topics for discussion as appropriate to status of Project.
    - a. Contractor's Construction Detention Work Subschedule: Review progress since last detention work coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - b. Schedule Updating: Revise Contractor's construction detention work subschedule after each detention work coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
    - c. Review present and future needs of each entity present, including the following:
      - 1) Detention work interface requirements.
      - 2) Sequence of detention work operations.
      - 3) Status of detention work submittals.
      - 4) Access to detention work.
      - 5) Temporary facilities and controls required by detention work.
      - 6) Quality and work standards of detention work.
      - 7) Change Orders for detention work.
  - 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. The DEC shall be responsible for receiving, unloading, storage and distribution of detention equipment specified.
- B. Do not store products on or in the structure in a manner that might cause distortion or damage to the products or the supporting structure.
- C. The DEC shall repair or replace materials damaged during handling, shipment, storage, distribution or installation without additional cost or time impact to the project. Damaged materials shall be repaired or replaced in an expeditious manner so as not to affect the project schedule or the work of other trades.



## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention work.
- B. Examine roughing-in for embedded conduits and tubing and built-in anchors to verify actual locations of detention work connections before detention work installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention work.
- D. Inspect built-in and cast-in anchors after installation but before connection to detention work to verify that anchor installations comply with requirements. Prepare inspection reports.
  - 1. Where inspections indicate that anchors do not comply with specified requirements, reinspect after repairs or replacements are made.
  - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- E. Verify locations of detention work with those indicated on coordination drawings.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 FIELD QUALITY CONTROL**

- A. Inspect installed detention work to verify compliance with requirements and that work is installed and connected according to the Contract Documents.
- B. Verify that wiring installation has been installed according to manufacturer's submittal and written installation requirements in electrical, communications, and electronic safety and security Sections.
- C. Observe installation and startup checks of detention work according to manufacturer's written instructions.
- D. Testing: After installing electrified detention work and after electrical circuitry has been energized, test for compliance with requirements.
  - 1. When testing reveals detention work does not comply with requirements, perform additional random testing to determine extent of noncompliance.
  - 2. Where test results indicate that detention work does not comply with specified requirements, retest after repairs or replacements are made.
  - 3. Perform additional testing and inspecting, at Contractor's expense, to determine compliance of replaced or additional work.
- E. Inspection Reports: Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
  - 1. Perform additional inspections to determine compliance of replaced or additional work.
- F. Field Quality-Control Certification: Prepare field quality-control certification endorsed by Detention Equipment Contractor that states installed detention work complies with requirements in the Contract Documents.

3.3 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain detention products and equipment.

END OF SECTION

## **SECTION 01 35 16 - ALTERATION PROJECT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes special procedures for alteration work.

#### **1.3 DEFINITIONS**

- A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.
- B. Consolidate: To strengthen loose or deteriorated materials in place.
- C. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.
- D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- K. Retain: To keep existing items that are not to be removed or dismantled.
- L. Strip: To remove existing finish down to base material unless otherwise indicated.

#### **1.4 COORDINATION**

- A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.
  - 1. Schedule construction operations in sequence required to obtain best Work results.
  - 2. Coordinate sequence of alteration work activities to accommodate the following:
    - a. Owner's continuing occupancy of portions of existing building.
    - b. Owner's partial occupancy of completed Work.
    - c. Other known work in progress.

- d. Tests and inspections.
  - 3. Detail sequence of alteration work, with start and end dates.
  - 4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
  - 5. Use of elevator and stairs.
  - 6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.
  - B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building(s) and site. Some work is within circulation patterns and adjacent to restricted areas. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Access to restricted areas may not be obstructed. Plan and execute the Work accordingly.
- 1.5 PROJECT MEETINGS FOR ALTERATION WORK
- A. Preliminary Conference for Alteration Work: Before starting alteration work, Construction Manager will conduct conference at Project site.
    - 1. Attendees: In addition to representatives of Owner, Construction Manager, Architect, and Contractors, testing service representative, and specialists shall be represented at the meeting.
    - 2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
      - a. Alteration Work Subschedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
      - b. Fire-prevention plan.
      - c. Governing regulations.
      - d. Areas where existing construction is to remain and the required protection.
      - e. Hauling routes.
      - f. Sequence of alteration work operations.
      - g. Storage, protection, and accounting for salvaged and specially fabricated items.
      - h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
      - i. Qualifications of personnel assigned to alteration work and assigned duties.
      - j. Requirements for extent and quality of work, tolerances, and required clearances.
      - k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.
    - 3. Reporting: Construction Manager will record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
  - B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at regular intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
    - 1. Attendees: Construction Manager, Contractors, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at these meetings. Owner and Architect shall be informed of meeting times. Inform Owner and Architect if their attendance is required to assist in resolving clashes. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.

2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
  - a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
  - b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
  - c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:
    - 1) Interface requirements of alteration work with other Project Work.
    - 2) Status of submittals for alteration work.
    - 3) Access to alteration work locations.
    - 4) Effectiveness of fire-prevention plan.
    - 5) Quality and work standards of alteration work.
    - 6) Change Orders for alteration work.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

#### 1.6 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.
  1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to Owner where directed at Project site.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Alteration Work Subschedule:
  1. Submit alteration work subschedule within seven days of date established for commencement of alteration work.
- B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.
- C. Fire-Prevention Plan: Submit 30 days before work begins.

#### 1.8 QUALITY ASSURANCE

- A. Specialist Qualifications: An experienced firm regularly engaged in specialty work similar in nature, materials, design, and extent to alteration work as specified in each Section and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.
  1. Field Supervisor Qualifications: Full-time supervisors experienced in specialty work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on-site when specialty work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.

- B. Title X Requirement: Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" according to 40 CFR 745, Subpart E, and use only workers that are trained in lead-safe work practices.
- C. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.
  - 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
  - 2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
- D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.
- E. Safety and Health Standard: Comply with ANSI/ASSE A10.6.

#### 1.9 STORAGE AND HANDLING OF SALVAGED MATERIALS

- A. Salvaged Materials:
  - 1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
  - 2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area off-site .
  - 5. Protect items from damage during transport and storage.
- B. Salvaged Materials for Reinstallation:
  - 1. Repair and clean items for reuse as indicated.
  - 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
  - 3. Protect items from damage during transport and storage.
  - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
- C. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.
- D. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
  - 1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
  - 2. Secure stored materials to protect from theft.
  - 3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F or more above the dew point.
- E. Storage Space:

1. Arrange for off-site locations for storage and protection of salvaged material that cannot be stored and protected on-site.

#### 1.10 FIELD CONDITIONS

- A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of preconstruction photographs.
- B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.
- C. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

### PART 2 - PRODUCTS

#### 2.1 SALVAGED MATERIALS

- A. Salvage sufficient quantities of cut or removed material to replace damaged work of existing construction, when material is not readily obtainable on current market.
  1. Store salvaged items in a dry, secure place on site.
  2. Items not required for use in repair of existing work shall remain the property of the Owner.
  3. Do not incorporate salvaged or used material in new construction except with permission of A/E.

#### 2.2 PRODUCTS FOR PATCHING, EXTENDING, AND MATCHING

- A. General Requirements that Work be Complete:
  1. Provide same products or types of construction as that in existing structure, as needed to patch, extend, or match existing work.
  2. Generally, Contract Documents will not define products or standards of workmanship present in existing construction; Subcontractor shall determine products by inspection and any necessary testing, and workmanship by use of the existing as a sample of comparison.
- B. Presence of a product, finish, or type of construction requires that patching, extending, or matching shall be performed as necessary to make Work complete and consistent to identical standards of quality.

### PART 3 - EXECUTION

#### 3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.
  1. Use only proven protection methods, appropriate to each area and surface being protected.
  2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
  3. Erect temporary barriers to form and maintain fire-egress routes.
  4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
- B. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.

1. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
  2. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
  3. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.
- C. Temporary Protection of Materials to Remain:
1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
  2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.
- D. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
- E. Utility and Communications Services:
1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
  2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
  3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.
- F. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
  2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- G. Existing Roofing: Prior to the start of work in an area, install roofing protection.

### 3.2 PROTECTION FROM FIRE

- A. General: Follow fire-prevention plan and the following:
1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
  2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
    - a. If combustible material cannot be removed, provide fire blankets to cover such materials.
- B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
1. Obtain Owner's approval for operations involving use of welding or other high-heat equipment. Use of open-flame equipment is not permitted. Notify Construction Manager at least 72 hours before each occurrence, indicating location of such work.
  2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.



3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that the area is safe.
  4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
  5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
  6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
    - a. Train each fire watch in the proper operation of fire-control equipment and alarms.
    - b. Prohibit fire-watch personnel from other work that would be a distraction from fire-watch duties.
    - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
    - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
    - e. Maintain fire-watch personnel at Project site until 60 minutes after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.
- 3.3 PROTECTION DURING APPLICATION OF CHEMICALS
- A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
  - B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
  - C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
  - D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.
  - E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.
- 3.4 GENERAL ALTERATION WORK
- A. Have specialty work performed only by qualified specialists.
  - B. Ensure that supervisory personnel are present when work begins and during its progress.

- C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs or video recordings.
- D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.
- E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

### 3.5 PERFORMANCE

- A. Patch and extend existing work using skilled mechanics that are capable of matching existing quality of workmanship. Quality of patched or extended work shall be not less than that specified for new work.

### 3.6 ADJUSTMENTS

- A. Where partitions are removed, patch floors, walls, and ceilings with finish materials to match existing.
- B. Where removal of partitions results in adjacent spaces becoming one, rework floors and ceilings to provide smooth planes without breaks, steps, or bulkheads. Realign existing ceiling grids to match new ceiling grids.
- C. Where extreme change of plane of two inches or more occurs, request instructions from A/E as to method of making transition.
- D. Trim and refinish existing doors as necessary to clear new floors.

### 3.7 DAMAGED SURFACES

- A. Patch and replace any portion of an existing finished surface that is found to be damaged, lifted, discolored, or shows other imperfections with matching material.
- B. Provide adequate support of substrate prior to patching the finish.
- C. Refinish patched portions of painted or coated surfaces in a manner to produce uniform color and texture over entire surface.
- D. When existing surface finish cannot be matched, refinish entire surface to nearest intersections.

### 3.8 TRANSITION FROM EXISTING TO NEW WORK

- A. When new work abuts or finishes flush with existing work, make a smooth and workmanlike transition. Patched work shall match existing adjacent work in texture and appearance so that the patch or transition is invisible at a distance of five feet.
- B. When finished surfaces are cut in such a way that smooth transition with new work is not possible, terminate existing surfaces in a neat manner along a straight line at a natural line of division, and provide trim appropriate to finish surface.

### 3.9 CLEANING

- A. Perform periodic and final cleaning as specified in Section 01 74 00.
  - 1. Clean Owner occupied areas daily.
  - 2. Clean spillage, overspray, and heavy collection of dust in Owner occupied areas immediately.
- B. At completion of work of each trade, clean area and make surfaces ready for work of successive trades.

- C. At completion of alterations work in each area, provide final cleaning and return space to a condition suitable for use by Owner.

END OF SECTION

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## SECTION 01 40 00 - QUALITY REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
  - 1. See individual specification sections for testing requirements.

#### 1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
  - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Full-size physical assemblies that are constructed either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
  - 1. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements, consisting of multiple products, assemblies, and subassemblies, with cutaways enabling inspection of concealed portions of the Work.

- a. Include each system, assembly, component, and part of the exterior wall to be constructed for the Project. Colors of components shall be those selected by the Architect for use in the Project.
  - 2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
  - 3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
  - F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
  - G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
  - H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" shall have the same meaning as the term "testing agency."
  - I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
  - J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect or Construction Manager.
- 1.4 DELEGATED-DESIGN SERVICES
- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
    - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
  - B. Delegated-Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- 1.5 CONFLICTING REQUIREMENTS
- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Entity responsible for performing tests and inspections.
  - 3. Description of test and inspection.
  - 4. Identification of applicable standards.
  - 5. Identification of test and inspection methods.
  - 6. Number of tests and inspections required.
  - 7. Time schedule or time span for tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.
- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

#### 1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, telephone number, and email address of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.
  - 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
  - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  - 12. Name and signature of laboratory inspector.
  - 13. Recommendations on retesting and reinspecting.

- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
  - 1. Name, address, telephone number, and email address of technical representative making report.
  - 2. Statement on condition of substrates and their acceptability for installation of product.
  - 3. Statement that products at Project site comply with requirements.
  - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
  - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  - 6. Statement of whether conditions, products, and installation will affect warranty.
  - 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
  - 1. Name, address, telephone number, and email address of factory-authorized service representative making report.
  - 2. Statement that equipment complies with requirements.
  - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
  - 4. Statement of whether conditions, products, and installation will affect warranty.
  - 5. Other required items indicated in individual Specification Sections.

## 1.8 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329 "Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection", or meets "Recommended Requirements of Independent Laboratory Qualification" published by American Council of Independent Laboratories, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.



- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
  - 1. Build mockups of size indicated.
  - 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
  - 3. Notify Architect and Construction Manager seven days in advance of dates and times when mockups will be constructed.
  - 4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
  - 5. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 6. Obtain Architect's and Construction Manager's approval of mockups before starting corresponding Work, fabrication, or construction.
    - a. Allow seven days for initial review and each re-review of each mockup.
  - 7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
  - 8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  - 9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 10. Demolish and remove mockups when directed unless otherwise indicated.

## 1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
  - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
  - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
  - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
  - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
  - 4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform duties of Contractor.
- E. Limitations Of Authority Of Testing Agency: Laboratory is not authorized to:
1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
  2. Approve or accept any portions of the Work other than those portions of the Work scheduled for testing.
  3. Perform any duties of the Contractor.
- F. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- G. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- H. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
  4. Facilities for storage and field curing of test samples.
  5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  6. Security and protection for samples and for testing and inspection equipment at Project site. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
  7. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.
  8. Make arrangements with laboratory and pay for additional samples and tests required for Contractor's convenience.

9. Employ and pay for the services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required when initial tests indicate work does not comply with Contract Documents.
  10. Temporarily halt the progress of the Work upon notification by the Owner or the Owner's designated representative that tested materials do not comply with Contract Documents.
  11. Remove and replace at no cost to the Owner, all defective materials discovered upon testing not to comply with Contract Documents.
- I. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- 1.10 SPECIAL TESTS AND INSPECTIONS
- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures, and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect, Construction Manager, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, through Construction Manager, with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected Work.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 TEST AND INSPECTION LOG**

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
  2. Description of the Work tested or inspected.
  3. Date test or inspection results were transmitted to Architect.
  4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's and Construction Manager's reference during normal working hours.
1. Submit log at Project closeout as part of Project Record Documents.

### **3.2 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

## **SECTION 01 41 00 - REGULATORY REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 REQUIREMENTS INCLUDED**

- A. Unless otherwise specifically directed by Prime Contractor each Subcontractor and each Sub-subcontractor shall comply with provisions of this Section as required for proper execution and completion of their Work or portions thereof.

#### **1.2 PROCEDURES**

- A. Comply with and give notices required by applicable laws, statutes, ordinances, codes, rules, and regulations, and lawful orders of public authorities having jurisdiction applicable to performance of the Work. Also comply with and give notices required by Owner's and Contractors' insurance companies, local utilities and labor regulations relating to the performance of the Work, the protection of adjacent property, and the maintenance of passage ways, guard fences or other protective facilities.
- B. Procure all certificates of inspection, use, and occupancy, and all permits and licenses, pay all charges and fees and give all notices necessary and incidental to the due and lawful prosecution of the Work. Certificates of inspection, use and occupancy shall be delivered to the Owner upon completion of the Work in sufficient time for occupation of the Project in accordance with the approved schedule for the Work. The costs of such procurement, payment and delivery shall be included within the Base Bid .
- C. Exercise caution at all times for the protection of persons (including employees) and property. Observe the safety provisions of applicable laws, building and construction codes. Refer to the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America.
- D. It is not Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, and rules and regulations. However, if Contractor observes that portions of the Contract Documents are at variance therewith, Contractor shall promptly notify A/E and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.
  - 1. If Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities having jurisdiction, the Contractor shall assume full responsibility for such Work and shall bear the costs attributable to correction.
- E. Refer to various Sections of the Work for referenced codes, standards, tests, etc., applicable to the Work.

### 1.3 CONCEALED OR UNKNOWN CONDITIONS

- A. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15 of the General Conditions of the Contract for Construction (AIA Doc A201-2017).
- B. If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15 of the General Conditions of the Contract for Construction (AIA Doc A201-2017).

### 1.4 TAXES

- A. Pay sales, consumer, use and similar taxes required by law, including but not limited to unemployment, FICA; State, Federal, and local municipality sales; excise and manufacturer's taxes for the Work provided by Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.
- B. If the tax laws are subsequently amended by legislation during the life of the Contract, necessary changes shall be accomplished by appropriate Modification.
- C. Sales and Use Tax Exemption:
  - 1. The Owner is considered a qualifying exempt entity per Section 77.54(9m) Wis. Stats.; a Wisconsin Sales and Use Tax Exemption Certificate (S-211) shall be issued to each Contractor to allow the Contractor to purchase qualifying products exempted by law specifically for the contracted project.
  - 2. Only materials for the contracted project may be purchased utilizing the exemption certificate. It is the responsibility of each Contractor to verify this rule is followed. Owner shall not be liable for any errors or inaccuracies in each Contractor's completion with this rule.

### 1.5 PERMITS

- A. Permits, Fees, Licenses, and Inspections: Unless otherwise provided in the Contract Documents, Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, inspections and approvals by government and utility agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

1. Owner will obtain code plan approvals and pay all associated fees required by the Wisconsin Department of Safety and Professional Services - Safety and Buildings Division and by the City of Jefferson, if any.
  2. EC shall obtain all permits and pay all fees required by local utilities for permanent electric service.
  3. HC shall obtain all permits and pay all fees required by local utilities for permanent gas service.
- B. Each Subcontractor shall furnish Construction Manager with copies of all required permits and certificates of inspection applicable to its work.
- C. Construction Manager shall furnish A/E with copy of all required permits and certificates.

**PART 2 - PRODUCTS - (Not Used)**

**PART 3 - EXECUTION - (Not Used)**

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## **SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

#### **1.3 USE CHARGES**

- A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- C. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- E. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
  - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
  - 2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
  - 3. Indicate methods to be used to avoid trapping water in finished work.

- F. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
    - 1. Locations of dust-control partitions at each phase of work.
    - 2. HVAC system isolation schematic drawing.
    - 3. Location of proposed air-filtration system discharge.
    - 4. Waste-handling procedures.
    - 5. Other dust-control measures.
  - G. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by the Owner. Include the following:
    - 1. Methods used to meet the goals and requirements of the Owner.
    - 2. Concrete cutting method(s) to be used.
    - 3. Location of construction devices on the site.
    - 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
    - 5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with the Owner.
- 1.5 QUALITY ASSURANCE
- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
  - B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
  - C. Accessible Temporary Egress: Comply with applicable provisions in ICC/ANSI A117.1.
- 1.6 PROJECT CONDITIONS
- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide galvanized-steel bases for supporting posts.
- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

### **2.2 TEMPORARY FACILITIES**

- A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, Construction Manager, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
  - 1. Furniture required for Project-site documents, including file cabinets, plan tables, plan racks, and bookcases.
  - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
  - 3. Drinking water and private toilet.
  - 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
  - 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
  - 1. Store combustible materials apart from building.

## 2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Where indicated for sequencing of the work, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
  - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  - 2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
  - 3. Portable Heaters: Standard units, in compliance with applicable codes and regulations. All heat systems shall vent combustion products to the exterior. Systems utilized shall not allow combustion products to accumulate in the building.
  - 4. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction.
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

## PART 3 - EXECUTION

### 3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

### 3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
  - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### 3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
  - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
  - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
  - 1. Extend system as necessary to comply with temporary water requirements.
  - 2. The use of the permanent system shall not serve to waive compliance with any requirements of the Contract Documents specified elsewhere.
- D. Prior to use of system for drinking water:
  - 1. Disinfect piping.
  - 2. Obtain inspections and approval of governing authority.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
  - 1. Use of Permanent Toilets: Use of Owner's existing or new toilet facilities is not permitted.
- F. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
  - 1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
  - 2. See requirements of Products Specifications (Divisions 02 thru 33) for minimum temperatures to be maintained for the various trades. Unless otherwise specified, maintain a minimum inside temperature of 50 degrees F. in permanently enclosed portions of building for normal construction activities, and 65 degrees F. for finishing activities and areas where finished Work has been installed.
  - 3. Ventilation Required: Prevent hazardous accumulations of dust, fumes, mists, vapors, or gasses in areas occupied during construction. Provide local exhaust ventilation to prevent harmful dispersal of hazardous substances into atmosphere of occupied areas. Dispose of exhaust materials in a manner that will not result in harmful exposure to persons. Ventilate storage spaces containing hazardous or volatile materials.

4. Cooling Required: To control humidity, and to prevent condensation which would have an adverse affect on the products and finishes or which would affect application of materials. To cure installed materials and to protect installed construction from adverse effects of high humidity.
  5. Temporary Natural Gas: HC shall arrange for and provide connection to permanent existing gas service or provide temporary gas service.
- G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.
    - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
    - b. Maintain negative air pressure within work area, using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
  2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
  3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- I. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
1. Connect temporary service to Owner's existing power source, as directed by Owner.
  2. Use of permanent system
    - a. Prior to use of permanent system for construction purposes, obtain written permission of Owner.
    - b. The use of the permanent system shall not serve to waive compliance with any requirements of the Contract Documents specified elsewhere.
    - c. Maintain permanent system as specified for temporary facilities.
- J. Provide temporary artificial lighting in enclosed areas and for all areas when natural light does not meet minimum requirements for:
1. Construction work. For work areas: Uniform illumination of 20 foot candles.
  2. Temporary offices, storage, shop and other construction buildings. Limit structures served to one temporary office and two accessory construction buildings for GC, PC, HC, and EC only.
  3. Illumination shall in all areas, meet or exceed State Code requirements or other more stringent State, local, or Federal requirements.
- K. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Architect and Owner.
- 3.4 SUPPORT FACILITIES INSTALLATION
- A. Comply with the following:
1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.

2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
- C. Temporary Use of Planned Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
  2. Prepare subgrade and install subbase and base for temporary roads and paved areas in accordance with Section 31 20 00 "Earth Moving."
  3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
  4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course in accordance with Section 32 12 16 "Asphalt Paving."
- D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
  2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Provide temporary offsite parking areas for construction personnel.
- F. Storage and Staging: Use designated areas of Project site for storage and staging needs.
- G. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Provide project identification sign on minimum 4'-0" high by 8'-0" wide weather resistant rigid substrate. Sign will include an architectural colored rendering of the building as well as identification information for the Prime Contractor, Architect, and Architect consultants.
    - a. A/E will furnish an electronic document file to the Prime Contractor for use by the sign company in the fabrication of the project identification sign.
    - b. Erect sign on job site where indicated by Architect. Provide adequate bracing to maintain in erected position.
    - c. Upon completion, remove from site.
  2. Provide temporary, directional signs for construction personnel and visitors.
  3. Maintain and touch up signs, so they are legible at all times.
- H. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

- J. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
  - 1. Do not load elevators beyond their rated weight capacity.
  - 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work, so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- K. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
  - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas, so no evidence remains of correction work.

### 3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
  - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- F. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
  - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
  - I. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
  - J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
    - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
  - K. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
    - 1. Construct dustproof partitions with gypsum wallboard, with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
    - 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
    - 3. Insulate partitions to control noise transmission to occupied areas.
    - 4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
    - 5. Protect air-handling equipment.
    - 6. Provide adhesive mats at each entrance through temporary partition.
  - L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
    - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
    - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
    - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
    - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
- 3.6 MOISTURE AND MOLD CONTROL
- A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.
  - B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
    - 1. Protect porous materials from water damage.
    - 2. Protect stored and installed material from flowing or standing water.
    - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
    - 4. Remove standing water from decks.
    - 5. Keep deck openings covered or dammed.
  - C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:



1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
  2. Keep interior spaces reasonably clean and protected from water damage.
  3. Periodically collect and remove waste containing cellulose or other organic matter.
  4. Discard or replace water-damaged material.
  5. Do not install material that is wet.
  6. Discard and replace stored or installed material that begins to grow mold.
  7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
  2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
  3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
    - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
    - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
    - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

### 3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
  2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

## **SECTION 01 60 00 - PRODUCT REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
  - 1. Section 01 10 00 "Summary" for Contractor requirements related to Owner-furnished products.
  - 2. Section 01 21 00 "Allowances" for products selected under an allowance.
  - 3. Section 01 25 00 "Substitution Procedures" for requests for substitutions.
  - 4. Section 01 77 00 "Closeout Procedures" for submitting warranties.

#### **1.3 DEFINITIONS**

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
  - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
  - 1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.

- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
  - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
  - 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 01 33 00 "Submittal Procedures."
- F. Substitution: Refer to Section 01 25 00 "Substitution Procedures" for definition and limitations on substitutions.

#### 1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
  - 1. Resolution of Compatibility Disputes between Multiple Contractors:
    - a. Contractors are responsible for providing products and construction methods compatible with products and construction methods of other contractors.
    - b. If a dispute arises between the multiple contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
  - 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
  - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
    - a. Name of product and manufacturer.
    - b. Model and serial number.
    - c. Capacity.
    - d. Speed.
    - e. Ratings.
  - 3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

#### 1.5 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

## 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.
- C. Storage:
  - 1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
  - 2. Store products to allow for inspection and measurement of quantity or counting of units.
  - 3. Store materials in a manner that will not endanger Project structure.
  - 4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
  - 5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
  - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
  - 7. Protect stored products from damage and liquids from freezing.
  - 8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  - 1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
  - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
  - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  - 2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
  - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

- C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

## **PART 2 - PRODUCTS**

### **2.1 PRODUCT SELECTION PROCEDURES**

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
  4. Where products are accompanied by the term "as selected," Architect will make selection.
  5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
  6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
    - a. Submit additional documentation required by Architect through Construction Manager in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Architect, whose determination is final.
- B. Product Selection Procedures:
1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
    - a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
  2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
    - a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."
  3. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.
    - a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
    - b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.
  4. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
    - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."

5. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
    - a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
    - b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
  6. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
    - a. For approval of products by unnamed manufacturers, comply with requirements in Section 01 25 00 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
  2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
  3. Evidence that proposed product provides specified warranty.
  4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
  5. Samples, if requested.
- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Section 01 33 00 "Submittal Procedures."
1. Form of Approval of Submittal: As specified in Section 01 33 00 "Submittal Procedures."

- C. Submittal Requirements, Single-Step Process: When acceptable to Architect, incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the Architect of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

### **PART 3 - EXECUTION**

#### **3.1 CONSTRUCTION EQUIPMENT**

- A. In addition to the requirements in labor and materials above, comply with the following:
1. Provide and maintain hoses and connections for water required in construction.
  2. Provide electrical power extension cords and provide temporary lighting if required in addition to that provided in Section 01 50 00.
  3. Provide independent source of power or special circuits for large electrical motors (1/3 HP and up) and welding equipment. Do not use temporary service system.

#### **3.2 USE OF MATERIALS AND EQUIPMENT INCORPORATED IN THE WORK**

- A. Obtain Owner's written permission to use completed portions of the Work prior to "Substantial Completion" of the whole work.
1. Limit such use to essential facilities required to expedite completion of the Project.
  2. Restore facilities used for temporary service to specified condition.
  3. If use of permanent completed sanitary facilities is desired, limit use to two rooms (one for each sex).
  4. Elevators may be used for material handling subject to Construction Manager and Owner approval.
  5. Permanent electrical service shall not be used for motors larger than fractional HP, nor for welding equipment.

END OF SECTION



## **SECTION 01 73 00 - EXECUTION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
  - 1. Construction layout.
  - 2. Field engineering and surveying.
  - 3. Installation of the Work.
  - 4. Cutting and patching.
  - 5. Coordination of Owner-installed products.
  - 6. Progress cleaning.
  - 7. Starting and adjusting.
  - 8. Protection of installed construction.
- B. Related Requirements:
  - 1. Section 01 10 00 "Summary" for coordination of Owner-furnished products, and limits on use of Project site.
  - 2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
  - 3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
  - 4. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.
  - 5. Section 07 84 13 "Penetration Firestopping" for patching penetrations in fire-rated construction.

#### **1.3 DEFINITIONS**

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Cutting and Patching Conference: Conduct conference at Project site.
  - 1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
    - a. Construction Manager
    - b. Contractor's superintendent.
    - c. Trade supervisor responsible for cutting operations.
    - d. Trade supervisor(s) responsible for patching of each type of substrate.
    - e. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.

2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor, certifying that location and elevation of improvements comply with requirements.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Final Property Survey: Submit 5 copies showing the Work performed and record survey data.

#### 1.7 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
  1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
  2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
  3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
  4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

### **PART 2 - PRODUCTS**

#### 2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
  1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
  - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
  - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
  - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
  - 1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
  - 2. List of detrimental conditions, including substrates.
  - 3. List of unacceptable installation tolerances.
  - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

#### **3.2 PREPARATION**

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect through Construction Manager in accordance with requirements in Section 01 31 00 "Project Management and Coordination."

### 3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect and Construction Manager promptly.
- B. Engage a land surveyor or professional engineer experienced in laying out the Work, using the following accepted surveying practices:
  - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
  - 2. Establish limits on use of Project site.
  - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
  - 4. Inform installers of lines and levels to which they must comply.
  - 5. Check the location, level and plumb, of every major element as the Work progresses.
  - 6. Notify Architect and Construction Manager when deviations from required lines and levels exceed allowable tolerances.
  - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Construction Manager.

### 3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
  - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Construction Manager before proceeding.
  - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
  - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
  3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- D. Records: Maintain a complete, accurate log of all control and survey work as it progresses.
- E. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
  2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

### 3.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb, and make horizontal work level.
  2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
  3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
  4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.
  - J. Repair or remove and replace damaged, defective, or nonconforming Work.
    1. Comply with Section 01 77 00 "Closeout Procedures" for repairing or removing and replacing defective Work.
- 3.6 CUTTING AND PATCHING
- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
    1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
  - B. Unless provided elsewhere in the Contract Documents, Subcontractor shall be responsible for cutting, patching, or fitting of Subcontractor's own Work as required to make its several parts fit together, or to receive the Work of other Subcontractors as shown or reasonably implied by the Drawings and Specifications to complete the Work or to:
    1. Uncover portions of the Work to provide for installation of ill-timed work.
    2. Remove and replace defective Work.
    3. Remove and replace work not conforming to requirements of Contract Documents.
    4. Remove samples of installed work as specified for testing.
  - C. All areas requiring cutting, fitting or patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.
  - D. The Contractor or Construction Manager shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor or Construction Manager shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Construction Managers shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.
  - E. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
  - F. Temporary Support: Provide temporary support of Work to be cut.
  - G. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
  - H. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 01 10 00 "Summary."
  - I. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

- J. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- K. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- L. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

### 3.7 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
  3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
    - a. Use containers intended for holding waste materials of type to be stored.
  4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
  5. Maintain Project site free of waste materials and debris. Do not allow the accumulation of scrap, debris, waste materials, and other items not required for construction of Work.
- B. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
  2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
  3. Weekly, and more often if necessary, inspect work areas and pick up all scrap, debris, and waste material; remove to designated holding area.
  4. Weekly, and more often if necessary, sweep all work areas clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and handheld broom.
  5. As required, preparatory to installation of succeeding material, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
  6. Following the installation of finish floor materials, clean finish floors daily (and more often if necessary) at all times while work is being performed in the space in which finish materials have been installed. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the A/E, may be injurious to the finish floor material.
- C. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- D. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- E. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- F. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- I. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.



3.8      STARTING AND ADJUSTING

- A.      Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B.      Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C.      Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D.      Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9      PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

- A.      Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B.      Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C.      Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- D.      Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

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## **SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for the following:
  - 1. Salvaging nonhazardous demolition and construction waste.
  - 2. Recycling nonhazardous demolition and construction waste.
  - 3. Disposing of nonhazardous demolition and construction waste.

#### **1.3 DEFINITIONS**

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

#### **1.4 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, demolition and construction waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For refrigerant recovery technician.
- B. Refrigerant Recovery: Comply with requirements in Section 02 41 19 "Selective Demolition" for refrigerant recovery submittals.

#### **1.6 QUALITY ASSURANCE**

- A. Refrigerant Recovery Technician Qualifications: Comply with requirements in Section 02 41 19 "Selective Demolition."

- B. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
  - 1. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  - 2. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  - 3. Review waste management requirements for each trade.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Goal: Achieve end-of-Project rates for salvage/recycling of 75 percent by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.

## **PART 3 - EXECUTION**

### **3.1 IMPLEMENTATION**

- A. General: Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
  - 1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
  - 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### **3.2 SALVAGING DEMOLITION WASTE**

- A. Comply with requirements in Section 02 41 19 "Selective Demolition" for salvaging demolition waste.
- B. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- C. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- D. Plumbing Fixtures: Separate by type and size.
- E. Lighting Fixtures: Separate lamps by type and protect from breakage.
- F. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

### 3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
  - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  - 4. Store components off the ground and protect from the weather.
  - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

### 3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
- C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- E. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- F. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- G. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- H. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.
- I. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
  - 1. Store clean, dry carpet and pad in a closed container or trailer provided by carpet reclamation agency or carpet recycler.
- J. Carpet Tile: Remove debris, trash, and adhesive.

1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.
- K. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.
- L. Conduit: Reduce conduit to straight lengths and store by material and size.
- M. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.

### 3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
  1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
  2. Polystyrene Packaging: Separate and bag materials.
  3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
  4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
  1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
  2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
- D. Paint: Seal containers and store by type.

### 3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. General: Except for items or materials to be salvaged or recycled, remove waste materials and legally dispose of at designated spoil areas on Owner's property.
- C. Burning: Do not burn waste materials.

END OF SECTION

## **SECTION 01 77 00 - CLOSEOUT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Final cleaning.
- B. Related Requirements:
  - 1. Section 01 29 00 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
  - 2. Section 01 78 23 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
  - 3. Section 01 78 39 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
  - 4. Section 01 79 00 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

#### **1.3 DEFINITIONS**

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's review, to determine if the Work is substantially complete.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

#### **1.6 SUBSTANTIAL COMPLETION PROCEDURES**

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting review for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
  3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Construction Manager. Label with manufacturer's name and model number.
    - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Construction Manager's signature for receipt of submittals.
  5. Submit testing, adjusting, and balancing records.
  6. Submit sustainable design submittals not previously submitted.
  7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting review for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
  2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  3. Complete startup and testing of systems and equipment.
  4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
  6. Advise Owner of changeover in utility services.
  7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
  8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  9. Complete final cleaning requirements.
  10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Review: Submit a written request for review to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final review and tests. On receipt of request, Architect and Construction Manager will either proceed with review or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after review or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Request rereview when the Work identified in previous reviews as incomplete is completed or corrected.
  2. Results of completed review will form the basis of requirements for Final Completion.



## 1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final review for determining Final Completion, complete the following:
  - 1. Submit a final Application for Payment in accordance with Section 01 29 00 "Payment Procedures."
  - 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion review list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  - 4. Submit pest-control final inspection report.
- B. Review: Submit a written request for final review to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final review and tests. On receipt of request, Architect and Construction Manager will either proceed with review or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after review or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
  - 1. Request rereview when the Work identified in previous reviews as incomplete is completed or corrected.

## 1.8 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
  - 1. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
  - 2. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect and Construction Manager.
    - d. Name of Contractor.
    - e. Page number.
  - 3. Submit list of incomplete items in the following format:
    - a. PDF Electronic File: Architect, through Construction Manager, will return annotated file.

## 1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
1. Submit on digital media acceptable to Architect.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

## **PART 3 - EXECUTION**

### **3.1 FINAL CLEANING**

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
1. General: Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Section 01 73 00.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting review for certification of Substantial Completion for entire Project or for a designated portion of Project:
    - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Remove snow and ice to provide safe access to building.
    - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
    - i. Vacuum and mop concrete.
    - j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
    - k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - l. Remove labels that are not permanent.

- m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    - p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
      - 1) Clean HVAC system in compliance with NADCA ACR. Provide written report on completion of cleaning.
    - q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
    - r. Clean strainers.
    - s. Leave Project clean and ready for occupancy.
  - C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.
  - D. Construction Waste Disposal: Comply with waste-disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- 3.2 REPAIR OF THE WORK
- A. Complete repair and restoration operations required by Section 01 73 00 "Execution" before requesting review for determination of Substantial Completion.

END OF SECTION

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## **SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory manuals.
  - 2. Systems and equipment operation manuals.
  - 3. Systems and equipment maintenance manuals.
  - 4. Product maintenance manuals.
- B. Related Requirements:
  - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

#### **1.3 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
  - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
  - 1. Submit on digital media acceptable to Architect. Enable reviewer comments on draft submittals.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and before commencing demonstration and training. Architect will return copy with comments.
  - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- E. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

## 1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
  - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals to Owner in the form of hard-copy, bound and labeled volumes.
  - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
  - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
  - 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
  - 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## 1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  - 1. Title page.
  - 2. Table of contents.
  - 3. Manual contents.
- B. Title Page: Include the following information:

1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Construction Manager.
  7. Name and contact information for Architect.
  8. Name and contact information for Commissioning Authority.
  9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
  10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
- 1.7 EMERGENCY , OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL
- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
  2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
  3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- B. Emergency Procedures: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
1. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
    - a. Fire.
    - b. Flood.
    - c. Gas leak.
    - d. Water leak.
    - e. Power failure.
    - f. Water outage.
    - g. System, subsystem, or equipment failure.
    - h. Chemical release or spill.

2. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
  3. Emergency Procedures: Include the following, as applicable:
    - a. Instructions on stopping.
    - b. Shutdown instructions for each type of emergency.
    - c. Operating instructions for conditions outside normal operating limits.
    - d. Required sequences for electric or electronic systems.
    - e. Special operating instructions and procedures.
- C. Systems and Equipment Operation: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
  3. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
    - a. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
    - b. Performance and design criteria if Contractor has delegated design responsibility.
    - c. Operating standards.
    - d. Operating procedures.
    - e. Operating logs.
    - f. Wiring diagrams.
    - g. Control diagrams.
    - h. Piped system diagrams.
    - i. Precautions against improper use.
    - j. License requirements including inspection and renewal dates.
  4. Descriptions: Include the following:
    - a. Product name and model number. Use designations for products indicated on Contract Documents.
    - b. Manufacturer's name.
    - c. Equipment identification with serial number of each component.
    - d. Equipment function.
    - e. Operating characteristics.
    - f. Limiting conditions.
    - g. Performance curves.
    - h. Engineering data and tests.
    - i. Complete nomenclature and number of replacement parts.
  5. Operating Procedures: Include the following, as applicable:
    - a. Startup procedures.
    - b. Equipment or system break-in procedures.
    - c. Routine and normal operating instructions.
    - d. Regulation and control procedures.
    - e. Instructions on stopping.
    - f. Normal shutdown instructions.
    - g. Seasonal and weekend operating instructions.
    - h. Required sequences for electric or electronic systems.
    - i. Special operating instructions and procedures.



6. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
  7. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.
- D. Systems and Equipment Maintenance: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
  3. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
  4. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
  5. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
    - a. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
      - 1) Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
    - b. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
    - c. Identification and nomenclature of parts and components.
    - d. List of items recommended to be stocked as spare parts.
  6. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
    - a. Test and inspection instructions.
    - b. Troubleshooting guide.
    - c. Precautions against improper maintenance.
    - d. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    - e. Aligning, adjusting, and checking instructions.
    - f. Demonstration and training video recording, if available.
  7. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
    - a. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
    - b. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

8. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
  9. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
  10. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
    - a. Include procedures to follow and required notifications for warranty claims.
  11. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
    - a. Do not use original project record documents as part of maintenance manuals.
- E. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
1. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
  2. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
  3. Product Information: Include the following, as applicable:
    - a. Product name and model number.
    - b. Manufacturer's name.
    - c. Color, pattern, and texture.
    - d. Material and chemical composition.
    - e. Reordering information for specially manufactured products.
  4. Maintenance Procedures: Include manufacturer's written recommendations and the following:
    - a. Inspection procedures.
    - b. Types of cleaning agents to be used and methods of cleaning.
    - c. List of cleaning agents and methods of cleaning detrimental to product.
    - d. Schedule for routine cleaning and maintenance.
    - e. Repair instructions.
  5. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
  6. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
    - a. Include procedures to follow and required notifications for warranty claims.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

END OF SECTION

## **SECTION 01 78 39 - PROJECT RECORD DOCUMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
  - 1. Record Drawings.
  - 2. Record specifications.
  - 3. Record Product Data.
  - 4. Miscellaneous record submittals.
- B. Related Requirements:
  - 1. Section 01 73 00 "Execution" for final property survey.
  - 2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
  - 3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

#### **1.3 CLOSEOUT SUBMITTALS**

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of Record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit PDF electronic files of scanned record prints.
      - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit PDF electronic files of scanned Record Prints and one set of file prints to Owner.
      - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.
- C. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.

#### **1.4 RECORD DRAWINGS**

- A. At Construction Manager's discretion, provide paper or digital Record Prints.
- B. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an acceptable drawing technique.
    - c. Record data as soon as possible after obtaining it.
    - d. Record and check the markup before enclosing concealed installations.
    - e. Cross-reference record prints to corresponding photographic documentation.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Construction Change Directive.
    - k. Changes made following Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- C. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file with comment function enabled.
  2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Architect through Construction Manager for resolution.
  4. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
    - a. See Section 01 31 00 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
    - b. Architect will provide data file layer information. Record markups in separate layers.
- D. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Format: Annotated PDF electronic file with comment function enabled.
  3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
  4. Identification: As follows:

- a. Project name.
- b. Date.
- c. Designation "PROJECT RECORD DRAWINGS."
- d. Name of Architect and Construction Manager.
- e. Name of Contractor.

#### 1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
  1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
  5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.
- B. Format: Submit record specifications as annotated PDF electronic file.

#### 1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file.
  1. Include Record Product Data directory organized by Specification Section number and title, electronically linked to each item of Record Product Data.

#### 1.7 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
  1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's and Construction Manager's reference during normal working hours.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

END OF SECTION

## **SECTION 01 79 00 - DEMONSTRATION AND TRAINING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
  - 1. Instruction in operation and maintenance of systems, subsystems, and equipment.
  - 2. Demonstration and training video recordings.
- B. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up. See requirements in Section 01 22 00 "Unit Prices."

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
  - 1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project.
    - b. Name and address of videographer.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Date of video recording.
  - 2. At completion of training, submit complete training manual(s) for Owner's use prepared in same paper and PDF file format required for operation and maintenance manuals specified in Section 01 78 23 "Operation and Maintenance Data."

#### **1.5 QUALITY ASSURANCE**

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.

## 1.6 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

## 1.7 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  - 2. Documentation: Review the following items in detail:
    - a. Emergency manuals.
    - b. Systems and equipment operation manuals.
    - c. Systems and equipment maintenance manuals.
    - d. Product maintenance manuals.
    - e. Project Record Documents.
    - f. Identification systems.
    - g. Warranties and bonds.
    - h. Maintenance service agreements and similar continuing commitments.
  - 3. Emergencies: Include the following, as applicable:
    - a. Instructions on meaning of warnings, trouble indications, and error messages.
    - b. Instructions on stopping.
    - c. Shutdown instructions for each type of emergency.
    - d. Operating instructions for conditions outside of normal operating limits.
    - e. Sequences for electric or electronic systems.
    - f. Special operating instructions and procedures.
  - 4. Operations: Include the following, as applicable:
    - a. Startup procedures.
    - b. Equipment or system break-in procedures.
    - c. Routine and normal operating instructions.
    - d. Regulation and control procedures.
    - e. Control sequences.
    - f. Safety procedures.
    - g. Instructions on stopping.
    - h. Normal shutdown instructions.
    - i. Operating procedures for emergencies.
    - j. Operating procedures for system, subsystem, or equipment failure.



- k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
- 5. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
- 7. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.
  - d. Procedures for routine cleaning.
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
- 8. Repairs: Include the following:
  - a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

#### 1.8 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

#### 1.9 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
  - 2. Owner will furnish an instructor to describe Owner's operational philosophy.
  - 3. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with Owner, through Construction Manager, with at least seven days' advance notice.

- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

#### 1.10 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode with vibration reduction technology.
  - 1. Submit video recordings on CD-ROM or thumb drive.
  - 2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
  - 3. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged according to Project Manual table of contents:
    - a. Name of Contractor/Installer.
    - b. Business address.
    - c. Business phone number.
    - d. Point of contact.
    - e. Email address.
- B. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
  - 1. Film training session(s) in segments not to exceed 15 minutes.
    - a. Produce segments to present a single significant piece of equipment per segment.
    - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
    - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- C. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
  - 1. Furnish additional portable lighting as required.
- D. Narration: Describe scenes on video recording by audio narration by microphone during instruction, or, if ambient sound prevents real time narration, by dubbing audio narration off-site after video recording is recorded. Include description of items being viewed.
- E. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

## **PART 2 - PRODUCTS**

## **PART 3 - EXECUTION**

END OF SECTION

## **DIVISION 02**



## SECTION 02 41 19 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Demolition and removal of selected site elements.
  - 3. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
  - 1. Section 01 10 00 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
  - 2. Section 01 35 16 "Alteration Project Procedures" for general protection and work procedures for alteration projects.

#### 1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

#### 1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

#### 1.4 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  - 5. Review areas where existing construction is to remain and requires protection.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection , for dust control and , for noise control. Indicate proposed locations and construction of barriers.
- C. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before Work begins.
- D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

#### 1.7 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

#### 1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. Hazardous materials will be removed by Owner before start of the Work.
  - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
  - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
  - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
  - 3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

#### 1.9 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

### **PART 2 - PRODUCTS**

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

### **PART 3 - EXECUTION**

#### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.
  1. Inventory and record the condition of items to be removed and salvaged.

#### 3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

#### 3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
  1. Arrange to shut off utilities with utility companies.
  2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

- d. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

### 3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

### 3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chipping. Temporarily cover openings to remain.
  - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  - 5. Maintain fire watch during and for at least 1 hour after flame-cutting operations.
  - 6. Maintain adequate ventilation when using cutting torches.
  - 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  - 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  - 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  - 10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.



- C. Removed and Salvaged Items:
    - 1. Clean salvaged items.
    - 2. Pack or crate items after cleaning. Identify contents of containers.
    - 3. Store items in a secure area until delivery to Owner.
    - 4. Protect items from damage during transport and storage.
  - D. Removed and Reinstalled Items:
    - 1. Clean and repair items to functional condition adequate for intended reuse.
    - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
    - 3. Protect items from damage during transport and storage.
    - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
  - E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- 3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS
- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
  - B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
  - C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
  - D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
  - E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section 07 53 23 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing" for new roofing requirements.
    - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
    - 2. Remove existing roofing system down to substrate.
- 3.7 DISPOSAL OF DEMOLISHED MATERIALS
- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."
    - 1. Do not allow demolished materials to accumulate on-site.
    - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
    - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
    - 4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
  - B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

## **DIVISION 03**



## **SECTION 03 10 00 - CONCRETE FORMWORK**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Design, construction and treatment of formwork and related accessories to confine and shape concrete to the required dimensions.
- B. Installation of embedded items such as flashing reglets, shelf angles, and PVC weeps.
- C. Structural notes indicated on the drawings regarding concrete formwork shall be considered a part of this specification.

#### **1.2 RELATED WORK**

- A. Pertinent Sections of Division 01.
- B. Section 03 20 00 - Concrete Reinforcement.
- C. Section 03 30 00 - Cast-in-Place Concrete.

#### **1.3 REFERENCES**

- A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where provisions of the pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
  - 1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
  - 2. ACI 301 - Specifications for Structural Concrete.
  - 3. ACI 318 - Building Code Requirements for Structural Concrete.
  - 4. ACI 347 - Guide to Formwork for Concrete.
  - 5. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - 6. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - 7. NIST - PS 1: Structural Plywood

#### **1.4 DESIGN REQUIREMENTS**

- A. Design and engineering of formwork is the responsibility of the Contractor. Design, engineer and construct formwork, shoring, and bracing to conform to Contract Documents and in accordance with building code requirements. Formwork design shall be under direct supervision of a Professional engineer experienced in the design of this work and licensed in the State where the project is located. Design for construction loads, lateral pressure, and requirements of the applicable building code to conform to the required shape, line, and dimensions. Contractor is responsible for formwork camber calculations.

- B. Drawings show the design requirements and dimensions for structural strength, but structural drawings do not show all detail dimensions to fit intricate architectural and mechanical detail. Contractor shall construct the concrete work so that it will conform to the clearance required by the architectural, mechanical, and electrical design.
- C. Maximum deflection of facing materials forming concrete surfaces exposed to view shall be 1/240 of the center-to-center span between structural members of the formwork.
- D. Carry vertical and lateral loads to the ground by a formwork system and in-place construction that has attained adequate strength for that purpose. Where adequate foundations for shores and struts cannot be secured, provide trussed supports.

## 1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions and specifications for each of the following:
  - 1. Form sealer
  - 2. Form release agent(s), including certification that agent is compatible with finish
  - 3. Form ties and spreaders
- B. Testing for Formwork Removal: When methods other than cylinder tests are proposed for determining time for formwork removal, submit data on methods for approval.

## 1.6 COORDINATION

- A. Coordinate with other sections of work that require attachment of components to formwork.
- B. If formwork is placed after reinforcement, resulting in insufficient concrete cover to reinforcement, request instructions from the Owner's Representative or Architect or Structural Engineer before proceeding.

# PART 2 - PRODUCTS

## 2.1 MATERIALS AND ACCESSORIES

- A. Formwork Accessories: Use commercially manufactured accessories for formwork accessories partially or completely embedded in concrete, including ties and hangers.
- B. Sealer: Clear, penetrating, synthetic resin sealer.
- C. Formwork Release Agent: Use commercially manufactured form release agents that will prevent formwork absorption of moisture, prevent bond with concrete, and will not stain the concrete surface. Reapply to cleaned forms before each reuse. Formwork release agent shall be compatible with paint, or any other finish applied to the concrete; submit data indicating compatibility.
- D. Form Material:
  - 1. No aluminum shall be allowed in the concrete work unless coated to prevent aluminum-concrete reaction.

2. Concrete form materials must be used in a manner to provide the surface finish specified.
3. Design formwork in accordance with the provisions of the building code or the following standards if not covered in the building code:
  - a. Wood - AWC "National Design Specification".
  - b. Plywood - American Plywood Association "Plywood Design Specification".
  - c. Steel - AISC "Manual of Steel Construction".
  - d. Aluminum - Aluminum Association "Aluminum Construction Manual"
  - e. Concrete - ACI 318.
  - f. Other materials - as directed by manufacturer.

E. Chamfer Strips:

1. Chamfer strips shall be the size as indicated on the drawings. Provide in maximum possible lengths.

## 2.2 FORM FINISHES

A. Rough Form Finish:

1. Concrete surfaces not exposed to view in the finished work shall have a rough-form finish. No form-facing material is specified for rough-form finish.
2. Set and maintain forms so finished concrete dimensions shall conform to the tolerances. Rough form finish is Designated Surface Finish-1.0 from ACI 301, except that surface tolerance Class C is required as specified in ACI 117.

B. Smooth Form Finish:

1. Concrete surfaces exposed to view in the finished work or surfaces to receive finishes of any type (paint, textured paint, etc.) shall have a smooth form finish. Form-facing material shall be plywood, tempered concrete-form-grade hardboard, metal, plastic, paper, or other acceptable material capable of producing the desired finish. Form-facing material shall produce a smooth, uniform texture on the concrete. Do not use form facing material with raised grain, torn surfaces, worn edges, patches, dents, or other defects that might impair the texture of the concrete surfaces.
2. Set and maintain forms so finished concrete dimensions shall conform to the tolerances. Smooth form finish is Designated Surface Finish-3.0 from ACI 301, including surface tolerance Class A as specified in ACI 117.

C. Patching and repairing concrete finishes are specified under Section 03 30 00.

## 2.3 FABRICATION AND MANUFACTURE

A. Form Ties and Spreaders: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms, hold inner and outer forms for vertical concrete together, and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1-1/2 inch to the plane of the exposed concrete surface.
2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.

3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.
4. At horizontal pour lines, locate ties not more than 6" below the pour lines. Tighten after concrete has set and before the next pour is made.
5. For exposed concrete surfaces, provide form ties of removable type with permanent plugs and a system approved by the Architect for fixing the plugs in place.

### **PART 3 - EXECUTION**

#### **3.1 CONSTRUCTION OF TEMPORARY FORMWORK**

- A. In accordance with ACI 301, construct formwork:
  1. Design, erect, shore, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until the concrete structure can support such loads.
  2. Obtain approval before framing openings in structural members not indicated on the drawings.
- B. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
  1. Provide crush or wrecking plates where stripping may damage cast concrete surfaces.
  2. Chamfer wood inserts for forming reglets, recesses, and the like to allow wood to swell without spalling concrete and to ensure easy removal.
- C. Falsework:
  1. Provide positive means of adjustment (wedges or jacks) of shores and struts. Do not adjust formwork after concrete has taken its initial set. Brace formwork securely against lateral deflection and lateral instability.
  2. To maintain specified tolerances, camber formwork to compensate for anticipated deflections in formwork prior to hardening of concrete. Formwork camber calculations are the responsibility of the formwork designer. Set formwork and intermediate screed strips for slabs accurately to produce designated elevations and contours of the finished surface prior to removal of formwork. Ensure edge forms and screed strips are sufficiently strong to support vibrating screeds or roller pipe screeds when the finish specified requires the use of such equipment.
  3. When formwork is cambered, set screeds to a like camber to maintain required concrete thickness.
  4. Verify lines, levels, and centers before proceeding with formwork. Ensure dimensions agree with the drawings.
  5. Fasten form wedges in place after final adjustment of forms and prior to concrete placement.
  6. Anchor formwork to shores, supporting surfaces, or members to prevent upward or lateral movement of the formwork system during concrete placement.
  7. Securely brace and shore forms to prevent displacement and to safely support construction loads.
  8. Construct forms plumb and straight to conform to slopes, lines, and dimensions shown.
  9. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
  10. Provide runways for moving equipment and support runways directly on formwork or structural member without resting on the reinforcing steel.



- D. Where end-of-work sequence requires a joint in the concrete, provide adequately designed additional formwork. Extend reinforcement through formwork as indicated on the drawings. Location of the construction joint is subject to approval by the Architect and the Structural Engineer.
- E. Forms for Exposed Concrete:
1. At construction joints, lap contact surface of the form sheathing for flush surfaces exposed to view over the hardened concrete in the previous placement by not more than 1 inch. Ensure formwork is held firmly against hardened concrete to prevent offsets or loss of mortar at construction joints and to maintain a true surface.
  2. Provide watertight formwork when architectural exposed concrete is specified.
  3. Unless specified in the Contract Documents, construct formwork so concrete surfaces conform to tolerance limits. The class of surface for offset between adjacent pieces of formwork facing material shall be Class C, unless specified otherwise.
  4. Do not use metal cover plates for patching holes or defects in forms.
  5. Provide sharp, clean corners at intersecting plans, without visible edges or offsets.
  6. Fill all unwanted joint openings with specified joint filler and finish flush to match adjacent form surfaces.
- F. Construct formwork for wall openings to facilitate removal and to counteract swelling of wood formwork. Keep wood forms wet as necessary to prevent shrinkage.
- G. Do not use rust-stained steel form-facing material.
- H. Provide temporary openings at the base of column and wall formwork and at other points where necessary to facilitate cleaning and inspection.
- I. Unless noted otherwise, all footings shall be centered under walls, piers, or columns.
- J. Provisions for Other Trades:
1. Place sleeves, inserts, anchors, and embedded items required for adjoining work or for support of adjoining work prior to concrete placement.
  2. Position and support expansion joint material and other embedded items to prevent displacement. Fill voids in sleeves, inserts, and anchor slots temporarily with readily removable material to prevent entry of concrete into voids.
- K. Projecting corners of walls and piers shall be formed with a 3/4-inch chamfer, unless noted otherwise on architectural drawings.
- L. Cleaning:
1. Clean surfaces of formwork and embedded materials of mortar, grout, and foreign material before concrete is placed.
  2. Cover surfaces of formwork with acceptable formwork release agent. Apply form release agent before placing reinforcing steel and concrete according to manufacturer's written instructions. Do not allow formwork release agent to puddle in forms. Do not allow formwork release agent to contact reinforcing steel or hardened concrete against which fresh concrete is to be placed. Do not apply form release agent to concrete surfaces receiving special finishes or applied coverings affected by the agent.
  3. Clean and inspect formwork immediately before concrete is placed.
- M. Provide forms for concrete work adjacent to earth banks including sides of footings, except where footing excavation is vertical rock cut.

- N. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.

### 3.2 COORDINATION

- A. Install all required pipe sleeves, cavities, or slots. Notify appropriate trades in due time so they may furnish information and make necessary installations. Check sizes, location and alignment of all openings, frames and other work, which are to be built-in including electrical boxes and conduit.
- B. Layout the run of partitions and establish location of openings so other trades may properly locate their work.
- C. Core drilling concrete is not permitted unless noted otherwise or approved in writing by the Architect. Notify the Architect in advance of conditions not shown on the drawings.

### 3.3 INSTALLATION OF EMBEDDED ITEMS

- A. Built-In Items:
  - 1. Confirm with Architect that all materials to be embedded are suitable for embedment in concrete.
  - 2. Build in anchors, inserts, and other devices indicated or required for various portions of work.
  - 3. Build in sleeves, thimbles, and other items furnished or set in place by other trades.
  - 4. Accurately position and support all embedded items prior to concrete placement. Secure embedded items against displacement during concrete placement operations.
  - 5. Fill voids with readily removable material to prevent entry of concrete into voids.
  - 6. Mechanical and Electrical shall provide and set required sleeves.
  - 7. Coordinate setting of all embedded items.

### 3.4 TOLERANCES

- A. Construction formwork to maintain tolerances required by ACI 301 and ACI 117.

### 3.5 REMOVAL OF FORMS

- A. When removal of formwork is based on concrete reaching a specified compressive strength, concrete will be presumed to have reached this strength when either of the following requirements has been met:
  - 1. Test cylinders, molded and cured under the same conditions for moisture and temperature as used for the concrete they represent, have reached the specified compressive strength.
  - 2. Concrete has been cured in accordance with the specifications for the same length of time as laboratory-cured cylinders, which have reached the specified strength. Determine the length of time concrete has been cured in the structure by the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50°F and the concrete has been damp or thoroughly sealed from evaporation and loss of moisture.

- B. Forms shall remain in place for the following periods of time. These periods represent cumulative number days or hours, not necessarily consecutive, during which the temperature of the air surrounding the concrete is above 50°F:
    - 1. Walls and Footings: 67% specified compressive strength or minimum 24 hours.
    - 2. One-Way Floor Slabs: 75% specified compressive strength.
  - C. When finishing is required, remove forms as soon as removal operations will not damage concrete.
  - D. Loosen wood formwork for wall openings when this can be accomplished without causing damage to concrete.
  - E. Do not allow removal of formwork to damage the fresh concrete for columns, walls, and other parts supporting the weight of the concrete. Perform needed repair and treatment required on vertical surfaces at once and follow immediately with specified curing.
- 3.6 FASTENER REMOVAL
- A. Remove all protruding fasteners left as a result of securing inserts to forms by Contractor responsible for insert.
  - B. Cutting flush with surface is not acceptable.
  - C. Patch exposed concrete surfaces if damaged during fastener removal process.
- 3.7 REMOVING AND REUSING FORMS
- A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
  - B. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by the Architect.

END OF SECTION

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## SECTION 03 20 00 - CONCRETE REINFORCEMENT

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Fabrication and placement of reinforcing steel for concrete and all related accessories.
- B. Reinforcing steel for use in bond beams, masonry columns, and lintels is specified in Division 4 and is not a part of the work in this section.
- C. Structural notes indicated on the drawings regarding concrete reinforcement shall be considered a part of this specification.

#### 1.2 RELATED WORK

- A. Pertinent Sections of Division 01.
- B. Section 03 10 00 - Concrete Formwork.
- C. Section 03 30 00 - Cast-in-Place Concrete.

#### 1.3 REFERENCES

- A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
  - 1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
  - 2. ACI 301 - Specifications for Structural Concrete.
  - 3. ACI 318 - Building Code Requirements for Structural Concrete.
  - 4. ACI SP-066 - ACI Detailing Manual.
  - 5. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
  - 6. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
  - 7. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

#### 1.4 SUBMITTALS

- A. Placing Drawings: Submit placing drawings showing fabrication dimensions and locations for placement of reinforcement and reinforcement accessories. Indicate bar sizes, spacing, locations, and quantities of reinforcing steel, bending and cutting diagrams, anchors, and supporting and spacing devices. Dowels shall be shown in placing drawings for the element that is to be placed first. Reinforcing steel descriptions or shop drawings shall be inch-pound sizes.
- B. Manufacturer's Certifications:
  - 1. Submit mill certifications at time of delivery.
- C. Splices: Submit request for splices not indicated in the Contract Documents. Request shall indicate locations, types, and lengths of splices for approval.

- D. Field Bending: Submit requests and procedure for field bending or straightening of reinforcement partially embedded in concrete not described in the Contract Documents.
  - E. Reinforcement Relocation: Submit requests to adjust reinforcement spacing necessitated by conflicts with other reinforcement, conduits, etc. for approval.
  - F. Alternative Reinforcement: Submit request to relocate any reinforcing bars that exceeds placement tolerances.
- 1.5 COORDINATION
- A. Coordinate reinforcement installation with the placement of formwork and other embedded items such as inserts, conduit, pipe sleeves, drains, metal supports, anchor rods, etc.
- 1.6 DELIVERY, STORAGE AND HANDLING
- A. Deliver reinforcement to the jobsite in bundles sorted and labeled with durable tags indicating bar size, length, and shop drawing mark. Bundles shall also bear testing laboratory tags indicating identified steel.
  - B. Store elevated clear of ground and protect at all times from contamination and deterioration.
  - C. Prevent bending, coating with earth, oil, or other material, or otherwise damaging the reinforcement.
  - D. Store welding electrodes in accordance with the requirements of AWS D1.4.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Bar Deformations: Bars used for reinforcement shall be deformed except welded wire reinforcement, which may be plain.
- B. Reinforcing Steel: Reinforcing steel shall conform to the ASTM standard and grade indicated in the General Notes on the drawings.
- C. Welded Wire Reinforcement: Welded wire reinforcement shall conform to the ASTM standard indicated in the General Notes on the drawings.
- D. Joint Dowel Bars: Plain-steel bars. Cut bars true to length with square ends and free of burrs.
- E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, precast concrete, or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.
  - 2. Concrete cast against earth: Bars may be supported by precast concrete bricks or approved prefabricated wire bar supports complying with CRSI recommendations with footpads large enough to support the weight of the bars and construction traffic without being pushed into underlying grade. Precast concrete blocks shall have a minimum compressive strength of 6,000 psi.

## 2.2 FABRICATION

- A. Fabrication Tolerances: Reinforcing steel shall be shop fabricated within tolerances according to ACI 117 and other applicable codes, and shall conform in size, shape, quantity, dimensions, etc. to the construction drawings and approved shop drawings.
- B. Bar Condition: Bars shall be free from mill scale, excessive rust, and other coatings, which would reduce or destroy the bond with the concrete. Wipe oil from forms before reinforcement is placed on or adjacent to so that oil will not be tracked over or in any way come into contact with the reinforcement.
- C. Bars Bending: Bars shall be bent cold, and no method of fabrication shall be used which would be injurious to the material. Heating of bars for bending is not permitted.
- D. Identification: After fabrication, bars shall be sorted, bundled, and tagged with metal tags bearing the bar mark before delivery to the jobsite.
- E. Reinforcing for continuous footings shall extend into spread footings a minimum of 2'-0".
- F. Dowels between footings and walls or piers shall be the same grade, size and spacing or number as the vertical reinforcing respectively, unless noted otherwise.

## PART 3 - EXECUTION

### 3.1 PLACING

- A. Reinforcement Relocation: When necessary to move reinforcement beyond the specified spacing to avoid interference with other reinforcement, or embedded items, submit resulting arrangement of reinforcement to Structural Engineer for approval.
- B. Reinforcement Cutting: Cutting of reinforcement which conflicts with embedded objects is not acceptable.
- C. Welded Wire Reinforcement: Extend welded wire reinforcement to within 1 inch of the concrete edge. Lap edges and ends of fabric sheets a minimum of two full mesh squares. Lace edges with 16-gauge tie wire. Support welded wire reinforcement during placing of concrete to assure required positioning in the slab. Do not place wire reinforcement on grade or metal deck and raise into position in freshly-placed concrete.
- D. Wire Tie Orientation: Set wire ties so ends are directed away from the concrete surface.
- E. Slab on Grade Reinforcement Placement: Place shrinkage and temperature reinforcement 1/3 of the slab thickness from the top surface of the slabs on grade unless noted otherwise on the drawings.
- F. Do not cut, displace, or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- G. Support for Reinforcement: Unless noted otherwise, supports for reinforcement shall have Class 2 protection as defined in the CRSI Manual of Standard Practice. Submit data on supports indicating class of protection at all different locations for approval. Supports shall not be used as bases for runways for concrete-conveying equipment and similar construction loads. Do not place reinforcing bars more than 2" beyond last leg of any continuous bar support.

- H. Support for Bars in Concrete Cast on Ground: Bar supports for slabs on grade, footings, and all other concrete cast directly onto grade shall be supported at an average spacing of 4 feet or less in each direction.
- I. Securing Reinforcing Bars: All bars must be placed, spaced, secured, and supported prior to casting concrete. Bars embedded in hardened or partially hardened concrete shall not be bent unless approved in writing prior to placement by the Structural Engineer.
- J. Foot Traffic: Restrict foot traffic over the slab on grade reinforcing after it has been properly positioned.
- K. Reinforcement at Expansion Joints: Do not continue reinforcement or other embedded metal items bonded to concrete through expansion joints. Dowels bonded on only one side of a joint and waterstops may extend through joint.
- L. Pumping Concrete: When using a pump to place concrete, pump hose shall be supported directly on forms. Do not allow hose to rest on reinforcing bars if doing so could cause displacement of bars.

END OF SECTION



## SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. All items required for executing and completing the cast-in-place concrete work and related work shown on the drawings or specified herein. Work shall include installation of items furnished in other sections of these specifications.
- B. Concrete paving, walks, and curbs are specified in Division 3 or 32.
- C. Structural notes indicated on the drawings regarding cast-in-place concrete shall be considered a part of this specification.

#### 1.2 RELATED WORK

- A. Pertinent Sections of Division 01.
- B. Section 03 10 00 - Concrete Formwork.
- C. Section 03 20 00 - Concrete Reinforcement.
- D. Section 05 31 00 - Steel Deck.

#### 1.3 REFERENCES

- A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provision of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
  - 1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
  - 2. ACI 301 - Specifications for Structural Concrete.
  - 3. ACI 302.1R - Guide to Concrete Floor and Slab Construction.
  - 4. ACI 302.2R - Guide for Concrete Slabs that Received Moisture-Sensitive Flooring Materials.
  - 5. ACI 304R - Guide to Measuring, Mixing, Transporting, and Placing Concrete.
  - 6. ACI 305.1 - Specification for Hot Weather Concreting.
  - 7. ACI 306.1 - Guide to Cold Weather Concreting.
  - 8. ACI 308R - Guide to External Curing of Concrete.
  - 9. ACI 309R - Guide for Consolidation of Concrete.
  - 10. ACI 318 - Building Code Requirements for Structural Concrete.
  - 11. ACI 347R - Guide to Formwork for Concrete.
  - 12. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
  - 13. ASTM C33 - Standard Specification for Concrete Aggregates.
  - 14. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - 15. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  - 16. ASTM C88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
  - 17. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
  - 18. ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

19. ASTM C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
20. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
21. ASTM C150 - Standard Specification for Portland Cement.
22. ASTM C157 - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete
23. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
24. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
25. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
26. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
27. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
28. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
29. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
30. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
31. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
32. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic Cement Concrete.
33. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
34. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
35. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
36. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.
37. ASTM E154 - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.
38. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
39. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
40. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

#### 1.4 SAMPLING AND TESTING REQUIREMENTS

- A. Maintain records verifying materials used are of the specified and accepted types and sizes and are in conformance with the requirements of the Contract Documents.
- B. Use of testing services will not relieve the Contractor of the responsibility to furnish materials and construction in full compliance with the Contract Documents.
- C. Take samples of fresh concrete at the job site for each mix design placed each day. Sampling and testing shall be done after the final addition and proper mixing of any water or admixtures that are added on site.
  1. Personnel and testing equipment shall meet the requirements of ASTM E329.
  2. Testing Frequency: Obtain at least one composite sample for each 150 cu. yd. or 5,000 sq. ft. of surface area, whichever is less or fraction thereof of each concrete mixture placed each day.

- a. On a given project, if the total volume of concrete is such that the frequency of testing required above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.
  3. A strength test shall be the average of the strengths of two 6x12 inch or three 4x8 inch cylinders made from the same sample of concrete and tested at 28 days.
- D. For each sample of fresh concrete, perform the following duties:
1. Measure and record slump in accordance with ASTM C143.
  2. Measure and record temperature in accordance with ASTM C1064.
    - a. Provide one test hourly when air temperature is 40°F and below and when 80°F and above, and one test for each composite sample.
  3. Measure and record air content by volume in accordance with either ASTM C231 or ASTM C173.
  4. Mold three 6x12 inch or four 4x8 inch cylinders (laboratory cylinders) in accordance with ASTM C31 to be laboratory-cured. Protect from moisture loss and maintain at 60°F to 80°F for 24 to 48 hours before moving. Deliver cylinders to testing laboratory for curing and testing.
  5. Mold two 6x12 inch or three 4x8 inch cylinders (field cylinder) in accordance with ASTM C31 to be field-cured. Field cylinder shall be placed as near as possible to the in-place concrete from which it was taken, protected, and cured in the same manner. Deliver field-cured cylinder to testing laboratory, and measure and record compressive strength in accordance with ASTM C39. Field cylinder shall be used to determine if concrete footings, walls, or piers have reached the required compressive strength for steel erection to begin.
- E. Measure and record compressive strength in accordance with ASTM C39 for laboratory cylinders. Test one laboratory cylinder at 7 days and all other cylinders at 28 days. Acceptance is based on the average of the two 6x12 inch or three 4x8 inch laboratory cured 28-day tests. Notify Architect in the event strength levels do not meet the acceptance requirements of ACI 318.
1. Any additional cylinders molded for Contractor to have a compressive strength test done before seven days shall be at the Contractor's expense.
- F. Prepare and submit test reports to the Architect, Engineer, Contractor and Supplier. Reports shall be completed and furnished within 48 hours of testing. Refer to description in Submittals.
- G. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- H. Should the strength of any grade of concrete for any portion of work, as indicated by molded test cylinders, fall below the minimum 28-day compressive strength specified on the drawings, upon approval of the Structural Engineer, the concrete supplier shall adjust the concrete mix for remaining portion of construction so that the resulting concrete meets the minimum strength requirements.

## 1.5 SUBMITTALS

- A. Concrete Materials: Submit information on concrete materials as listed below.
  - 1. Cementitious materials: Submit type, class, producer name, and certification not more than 90 days old of compliance with applicable ASTM standard.
  - 2. Aggregates: Submit type, pit or quarry location, producer name, gradations, specific gravity, water content, and certification not more than 90 days old.
  - 3. Admixtures: Submit product data sheet. Product data shall include: dosages and performance data, brand names, producers, chloride ion concentrations, and certifications of compliance with applicable ASTM standard. Certifications shall not be more than 90 days old.
  - 4. Water: Submit name of source.
- B. Product Data: Prepare and submit product and performance data for materials and accessories, including patching compounds, joint systems, curing compounds, finish materials, and other concrete related items.
- C. Testing Agency Qualifications: When requested, the proposed testing agencies shall submit data on qualifications for acceptance.
- D. Concrete Mix Design:
  - 1. Concrete mix design submittals shall be submitted to the Structural Engineer for review and approval at least 14 days prior to placing concrete.
  - 2. Obtain Structural Engineer approval for each mix design prior to use, including new mix designs required to be prepared should there be a change in materials being used.
  - 3. Submit concrete mixture proportions and characteristics for each concrete mix. Include standard deviation analysis or trial batch data with mix design. Submit historical field test data to demonstrate the average compressive strength for approval. Concrete mix proportions, materials, and handling methods for field test data or trial batches shall be the same as used for the work. Include the following information for each mix design:
    - a. Water/cementitious materials ratio.
    - b. Slump per ASTM C143
    - c. Air content per ASTM C231 or ASTM C173
    - d. Unit weight of concrete per ASTM C138
    - e. Compressive strength at 28 days per ASTM C39
  - 4. If trial batches are used, submit representative samples of each proposed ingredient to independent testing laboratory for use in preparation of mix design.
  - 5. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at Project site.
  - 6. Provide a record copy of the final mix designs and test results to the testing agency prior to commencement of the concrete work.
- E. Test Reports: Submit laboratory test reports for concrete materials, mix design, compressive strength, slump, air content, and temperature. Each report shall indicate date of sampling, date of test, mix design, and location of concrete in structure.
- F. Repair Methods: When stains, rust, efflorescence, and surface deposits must be removed, submit the proposed method of removal.

- G. Certificates: Submit written certification regarding the design mix from the ready-mix supplier and the admixture manufacturer stating all concrete and admixtures do not contain chloride ions in excess of concentrations specified herein.
  - H. Placement Notification: Notify the Architect at least 24 hours in advance of concrete placement.
  - I. Adjustments: Submit any adjustments to mixture proportions or changes in materials, suppliers, or sources, along with supporting documentation, during the course of the work.
  - J. Cold Weather Procedure Submittal: Refer to Cold Weather Concreting article in Part 3 for more information.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Cementitious materials: Store cementitious materials in dry weather tight buildings, bins, or silos that exclude contaminants.
  - B. Aggregates: Store and handle aggregate in a manner that will avoid segregation and prevent contamination with other materials or other sizes of aggregates. Store aggregates so as to drain freely.
  - C. Admixtures: Protect stored admixtures against contamination, evaporation, or damage. Protect liquid admixtures from freezing and temperature changes, which would adversely affect their performance. Handle chemical admixtures in accordance with manufacturer's instructions.

## **PART 2 - PRODUCTS**

### **2.1 CONCRETE MATERIALS**

- A. Portland Cement: Portland cement shall conform to ASTM C150, Type I Normal, and be a standard brand of Portland cement. Use one brand of cement throughout project, unless approved in writing by the Engineer. Cement, which conforms to ASTM C150 Type II or ASTM C595 Type II, may be used if it also meets the requirements of ASTM C150 Type I. Cement used in concrete shall be of the same brand and type as the cement used in the concrete represented by the submitted field test data or used in the trial mixtures. Maintain consistent cement color throughout project unless directed otherwise by architectural requirements.
  - 1. Total replacement of Portland cement by supplementary cementitious materials in design mixture shall not exceed 50% (by weight).
- B. Supplementary Cementitious Materials
  - 1. Fly Ash: Fly ash shall conform to ASTM C618, Class C or Class F. Replacement of Portland cement by fly ash shall not exceed the following (percentages are by weight):
    - a. Concrete Flatwork: 20 percent.
    - b. All other concrete: 25 percent.
    - c. Concrete to be placed in cold weather as defined herein: No fly ash allowed unless the cold weather procedure submitted has compensated for the increased setting time and decreased rate of strength gain due to cold weather and fly ash.

2. Slag Cement: ASTM C989, Grade 100 or 120.
    - a. Ground Granulated Blast-Furnace Slag Limit: 50% by weight of total cementitious materials.
  3. Combined Fly Ash and Ground Granulated Blast-Furnace Slag:
    - a. Supplementary Cementitious Materials Limit: 50% with fly ash not exceeding 25% by weight of total cementitious materials.
- C. Coarse Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide coarse aggregate from a single source for exposed concrete. Gradations shall be similar to that described in the following table:

COARSE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 16
4	90-100 Note 1	20-55	0-15	---	0-5	---	---
57	100	95-100	---	25-60	0-10	0-10	---
67	---	100	90-100	---	20-55	0-10	---
89	---	---	---	100	90-100	20-55	0-10

1. Shall be 100 percent passing the 2" sieve.
- D. Fine Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide fine aggregate from a single source for exposed concrete. Fine aggregate shall consist of washed sand. Gradations shall be similar to that described in the following table:

FINE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	3/8	No. 4	No. 8	No. 16	No. 50	No. 80	No. 100
FA	100	95-100	80-100	50-85	5-30	---	0-10

- E. Do not use aggregates containing deleterious substances that could cause spalling on any exterior exposed surface. These include, but are not limited to the following:
1. Organic impurities.
  2. Ferrous metals.
  3. Soluble salts.
  4. Coal, lignite, or other lightweight materials.
  5. Soft particles.
  6. Clay lumps and friable particles.
  7. Cherts of less than 2.40 specific gravity.

- F. Water: Mixing water for concrete shall meet the requirements of ASTM C94. Water shall be clean and free from injurious amounts of acids, alkalis, organic materials, chloride ions and oils deleterious to concrete or reinforcing steel.
- G. Testing agency shall be given access to plants and stockpiles to obtain samples for testing for compliance with the Contract Documents.

## 2.2 ADMIXTURES

- A. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures. Calcium chloride thiocyanates or admixtures containing intentionally added chlorides are not permitted.
- B. Water Reducing Admixture: Material shall comply with ASTM C494, Type A.
  - 1. Acceptable:
    - a. BASF Corporation - MasterPozzolith Series or MasterPolyheed Series.
    - b. Chemical Company - Eucon WR Series.
    - c. Sika Chemical Corp. - Plastocrete 161.
    - d. GRT - Polychem 400 NC.
    - e. Grace Construction Products - WRDA 82.
- C. High Range Water Reducing Admixture (superplasticizer): Material shall comply with ASTM C494, Type F or Type G.
  - 1. Acceptable:
    - a. BASF Corporation - MasterRheobuild 1000 or MasterGlenium Series.
    - b. Euclid Chemical Company - Eucon 37 or Plastol Series.
    - c. Sika - ViscoCrete 2100.
    - d. GRT - Melchem.
    - e. Grace Construction Products - Mira 110.
- D. High Range Water Reducing, Slump Retaining Admixture: Material shall comply with ASTM C494, Type F or Type G.
  - 1. Acceptable:
    - a. BASF Corporation - MasterGlenium 7700.
    - b. Euclid Chemical Company - Eucon 537, Eucon 1037, or Plastol Series.
    - c. Sika - Sikament 686.
    - d. GRT - Melchem - M.
    - e. Grace Construction Products - ADVA FLEX.
- E. Non-Chloride Accelerator: Material shall comply with ASTM C494, Type C or Type E, and not contain a higher chloride ion concentration than municipal drinking water.
  - 1. Acceptable:
    - a. BASF Corporation - MasterSet FP 20 or MasterSet AC 534.
    - b. Euclid Chemical Company - Accelguard Series.
    - c. Sika Chemical Corp. - Sika Rapid-1.
    - d. GRT - Polychem HE.
    - e. Grace Construction Products - Lubricon NCA.

- F. Air Entraining Admixture: Air entraining admixture shall comply with ASTM C260, and be certified by the manufacturer to be compatible with other admixtures to be used.

1. Acceptable:

- a. BASF Corporation - MasterAir Series.
- b. Euclid Chemical Company - Air-Mix or AEA Series.
- c. Sika Chemical Corporation - Sika-Aer.
- d. GRT - Polychem VR.
- e. Grace Construction Products - Darex II or Daravair 1000.

- G. Admixtures used in concrete shall be the same brand, type, and dosage used in concrete represented by field test data or used in trial mixes.

## 2.3 CURING PRODUCTS

A. Moisture Retaining Cover

1. Plastic Film: Use 6 mil polyethylene film sheet materials that meet the requirements of ASTM C171.
2. White burlap-polyethylene sheet meeting ASTM C171.
3. Reinforced curing paper complying with ASTM C171.
4. Moisture Retaining Fabric: A naturally colored, non-woven, polypropylene fabric with a 4-mil, non-perforated reflective (white) polyethylene coating containing stabilizers to resist degradation from ultraviolet light. Fabric shall exhibit low permeability and high moisture retention. Acceptable manufacturers and products include:

- a. PNA Construction Technologies, Inc.: Hydracure S16.
- b. PNA Construction Technologies, Inc.: Hydracure M5.
- c. Reef Industries Incorporated: Transguard 4000.

- B. Dissipating Resin Curing Compound: Clear, waterborne, membrane-forming curing compound complying with ASTM C309, Type 1, Class B shall be composed of hydrocarbon resins and dissipating agents that begin to break down upon exposure to ultraviolet light and traffic approximately 4 to 6 weeks after application, providing a film that is removable with standard degreasing agents and mechanized scrubbing actions so as to not impair the later addition of applied finishes.

1. Curing compounds used on interior enclosed environments shall be a water-borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

- C. Non-dissipating Curing Compound: Clear, membrane-forming curing compound complying with ASTM C309, Type 1, Class B.

1. Curing compounds used on interior enclosed environments shall be a water-borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

- D. Curing and Sealing Compound: Clear, membrane-forming curing and sealing compound complying with ASTM C309, Type 1, and ASTM C1315, Type 1, Class A. Compound shall dry to a clear finish, resist yellowing due to ultraviolet degradation and provide a long-lasting finish that has high resistance to chemicals, oil, grease, deicing salts, and abrasion.

1. Curing and sealing compounds used on interior enclosed environments shall be a water-borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.



## 2.4 MISCELLANEOUS MATERIALS

- A. Patching Mortar: Non-shrink, non-slump, non-metallic, quick setting.
1. Acceptable manufacturers and products:
    - a. Euclid Chemical Company - Eucospeed.
    - b. BASF Corporation - MasterEmaco N 424.
    - c. Adhesive Technologies. - Hard Rok Vertipatch.
    - d. W.R. Meadows - Speed Crete (Red Line).
    - e. Dayton Superior - Re-Crete 20 minute.
    - f. SpecChem - Precast Patch.
- B. Cement Grout: Mix 1 part Portland cement, 2-1/2 to 3 parts fine aggregate, and enough water for required consistency. Depending on use, consistency may range from mortar consistency to a mixture that will flow under its own weight. Do not mix more than the amount that can be used within 30 minutes. Retempering is not permitted. Use for leveling, preparing setting pads, beds, construction joints (with liquid bonding admixture) and similar uses. Do not use for grouting under bearing plates or structural members in place.
- C. Dry-Pack: Mix 1 part Portland cement, 2 parts fine aggregate, and enough water to hydrate cement and provide a mixture that can be molded with the hands into a stable ball (a stiff mix). Do not mix more than the amount that can be used within 30 minutes.
- D. Expansion Joint Material: Preformed, resilient, non-extruding asphalt-impregnated fiber conforming to ASTM D1751. Thickness of expansion joint material shall be 1/2" unless noted otherwise on the drawings.
- E. Magnesium phosphate patching cement specially designed for cold weather grouting and anchoring.
1. Acceptable:
    - a. BASF Corporation - MasterEmaco T545.
    - b. Euclid Chemical Company - Eucospeed MP.
- F. Vapor Retarder: ASTM E 1745, Class A, not less than 10 mils thick.
1. Acceptable:
    - a. Stego Industries, LLC - Stego Wrap.
    - b. W.R. Meadows, Inc. - Perminator.
    - c. Raven Industries - Vapor Block
    - d. Insulation Solutions - Viper VaporCheck II.
- G. Penetrating Liquid Floor Treatment: Chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.
1. Manufacturers and products:
    - a. BASF Corporation - MasterKure HD 200WB.
    - b. Conspec Marketing & Manufacturing Co., Inc. - Intraseal
    - c. Curecrete Chemical Co., Inc. - Ashford Formula
    - d. Dayton Superior Corporation - Day-Chem Sure Hard (J-17)

- e. Euclid Chemical Company - Eucosil
- f. L&M Construction Chemicals, Inc. - Seal Hard
- g. Vexcon Chemicals, Inc - Vexcon Starseal PS
- h. SpecChem - SpecHard

H. Control Joint Filler: Flexible, single-component polyurethane sealant with backer rod compliant with ASTM C 920, Type S, Grade P, Class 25. Apply sealant per manufacturers written recommendations.

1. Acceptable:

- a. Dayton Superior - Perma 230 SL.
- b. Euclid Chemical Company - Eucolastic I.
- c. BASF Corporation - MasterSeal SL 1.

## 2.5 STRENGTH AND PROPERTIES

A. Concrete Mix Designs: Refer to the drawings for specified compressive strength. Proportion concrete mixes according to the properties in the following table. The concrete supplier may produce a mix at a lower water-cement ratio to allow for adjustment of slump at the site by adding water. The addition of site water shall be in accordance with ASTM C94, and the total water-cement ratio shall not exceed the value specified below.

Class	Coarse Aggregate Gradation	Fine Aggregate Gradation	Range of Slump	Max. w/c	Air Content	Other Requirements
A	57 or 67	FA	1" to 4"	0.40	5% to 8%	
B	57 or 67	FA	1" to 4"	0.45	5% to 8%	
C	57 or 67	FA	1" to 4"	0.50	n/a	
D	57 or 67	FA	4" to 6"	0.50	n/a	Use water reducing admixture to achieve slump specified
E	4 or 57	FA	1" to 4"	0.50	n/a	
F	4 or 57	FA	5" to 8"	0.50	n/a	Use retarder
H	89	FA	5" to 8"	0.50	n/a	
J	Light-weight	FA	5" max	0.5	4% to 7%	

B. Schedule of Concrete Classes: Provide concrete of the specified class according to the following:

- 1. Footings: Class E
- 2. Exterior foundation walls and piers: Class B
- 3. Interior piers: Class C
- 4. Retaining walls: Class B
- 5. Interior slabs on grade: Class D
- 6. Interior slab on metal decks: Class D
- 7. Unless noted otherwise: Class B

- C. Slump of Superplasticized Concrete: Concrete containing high-range water reducing admixtures (superplasticizer) shall have 8" maximum slump, unless otherwise approved by Structural Engineer.
- D. Accelerators: Add non-chloride accelerator to all concrete slabs placed at air temperatures below 50°F only when approved in the mix design. Use of admixtures will not relax cold weather placement requirements.
- E. Water Reducer: Add water reducing admixture or high range water reducing admixtures (superplasticizers) as follows:
  - 1. All pumped concrete.
  - 2. Fiber reinforced concrete.
  - 3. As required for placement or workability.
  - 4. As required by high temperatures, low humidity, or other adverse placement conditions.
  - 5. Concrete with water-cementitious materials ratio below 0.50.
- F. No other admixtures shall be used unless approved by Structural Engineer.
- G. Workability: Concrete shall have a workability such that it will fill the forms without voids, honeycombs, or rock pockets with proper vibration without permitting materials to separate or excess water to collect on the surface.
- H. Concrete Temperatures: Minimum concrete temperature of fresh concrete varies in relation to average air temperature over a 24-hour period as follows:
 

1. Air temperature below 0°F	Concrete temperature 70°F min.
2. Air temperature 0°F to 30°F	Concrete temperature 65°F min.
3. Air temperature 30°F to 50°F	Concrete temperature 50°F min.
4. Air temperature above 50°F	No minimum temperature
5. The maximum temperature of concrete at the time of delivery shall be 90°F. When concrete temperature exceeds 90°F, concrete supplier shall attempt to reduce temperature by shading aggregates and cement and cooling mix water. When these methods fail to reduce the concrete temperature below 0°F, supplier shall use ice in the water to reduce the concrete temperature. Use set retarding admixtures only when approved in the mix design.	

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Verify requirements for concrete cover over reinforcement.
- B. Verify anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.
- C. Do not place concrete until data on materials and mix designs have been approved, Architect has been notified, and all other affected trades have coordinated their work.
- D. Remove snow, ice, frost, water, mud, and other foreign material from surfaces, reinforcing bars and embedded items against which concrete will be placed.
- E. Prepare previously placed concrete by cleaning with sandblasting, steel brush, or water blast to expose aggregate to minimum 1/4" amplitude.

- F. Sandblast all existing concrete surfaces older than 28 days against which concrete is to be placed, unless directed otherwise in writing by Architect/Engineer.

### 3.2 SLABS

#### A. Slab on Grade:

1. All interior slabs on grade shall have a polyethylene vapor retarder conforming to ASTM E1745. Lap all joints minimum 6" and seal edges with adhesive tape. Fit vapor retarder around utilities and seal with adhesive tape as required. Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions.
2. Refer to drawings and Section 31 23 00 for required sub-grade preparation beneath slabs on grade.
3. Where vapor retarder is not used below the slab on grade, wet sub-grade below slab prior to placing concrete. Subgrade shall be moist with no free water and no muddy or soft spots.
4. Saw cut control joints: Cut with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Control joints shall be located along column lines, with intermediate joints spaced at a maximum distance indicated on the drawings, unless noted otherwise. Control joints shall be continuous, not staggered or offset. Slab panels shall have a maximum length to width ratio of 1.5 to 1. Provide additional control joints at all reentrant or isolated corners formed in the slab on grade. Refer to the drawings for typical control joint detailing.
5. Provide isolation joints around each column, and along foundation walls. Form isolation joints with 1/2" expansion joint material. Extend isolation joint material full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
6. Depress slabs as required for architectural finishes, pits. Obtain layout and locations from Architect.
7. Verify completion of all under slab work with mechanical and electrical trades before placing slabs.
8. Slope slabs as indicated on the drawings and to provide positive drainage. Slope slab keeping bottom level and varying top. Maintain minimum thickness of concrete as indicated on the drawings. Refer to floor finishes for tolerances.

#### B. All supported slabs, including slabs-on-steel decking and cast-in-place concrete slabs:

1. Supported slabs have deflections that may cause areas of concrete to have thicknesses greater than indicated on the drawings. Contractor is expected to provide that volume as needed to finish the floor at the specified elevation. If specified floor finish tolerances are not achieved during the concrete floor construction, the Contractor shall install, at no cost to the project, a self-leveling cementitious underlayment BASF Corporation - MasterTop 110 SL or approved equivalent to correct the floor flatness and levelness.

### 3.3 CONSTRUCTION JOINTS

- A. Slabs: Where slab pour is to receive a subsequent topping or additional concrete, expose aggregate in top surface by brooming in two directions at right angles to each other.
- B. Vertical: Locate vertical construction joints in walls not farther than a maximum of 100 feet on center. Coordinate joint locations with architectural design.

- C. Horizontal: Locate horizontal joints in walls, piers, at underside of slabs, and at the top of slabs and footings unless otherwise indicated. At least 24 hours shall elapse between placing concrete in a wall, and placing concrete in an area supported by the walls, unless approved in writing by the Structural Engineer.
- D. Reinforcing: Stop all welded wire reinforcement and/or reinforcing at construction joints in slabs on grade and provide dowel bars as detailed. Provide reinforcement at other construction joints as detailed. Roughen and thoroughly clean the surface of the concrete, remove all laitance, and wet the surface before placing new concrete against the joint. Slush vertical joints with a neat cement grout before placing new concrete.
- E. Wall Control Joints: Locate vertical control joints in exposed walls at a minimum uniform spacing not to exceed 25'-0". Coordinate joint locations with architectural drawings.
- F. Exposed Surfaces: Locate construction joints only at predetermined locations approved by the Architect and the Structural Engineer.

### 3.4 CONCRETE PLACEMENT

- A. Place concrete as continuously as possible until placement is complete. Do not place against concrete that has attained initial set, except at authorized joints. If, for any reason, concrete pour is delayed for more than 45 minutes, bulkhead off pour at last acceptable construction joint. Immediately remove excess concrete and clean forms.
- B. Do not begin to place concrete during periods of rain, sleet, or snow unless adequate protection is provided.
- C. No concrete shall be cast onto or against sub-grades containing free water, frost, ice, or snow. If earth at bottom of forms has dried out, rewet so the soil is moist, but free of standing water and mud.
- D. Notify the Architect in advance if concrete is to be pumped.
- E. Do not place concrete until all reinforcement is in place, forms have been thoroughly cleaned and approval has been given.
- F. Do not accept concrete delivered to the job site more than 90 minutes after initial mixing.
- G. Concrete from its point of release to mixers, hoppers, or conveyances, shall not be permitted to drop more than 5 feet (10 feet for concrete containing high range water reducers). Deposit concrete directly into conveyances and directly from conveyances to final points of deposit. Sufficient transportation equipment in good working order shall be on hand before work begins. All conveying equipment must be clean and kept clean during concreting operations. Take every possible precaution to prevent segregation or loss of ingredients.
- H. Regulate rate of placement so concrete surface is kept level throughout; a minimum being permitted to flow from one area to another. Use tremie heads spaced at approximately 10-foot intervals for placing concrete in walls. Control rate of placement consistent with form design.
- I. Deposit concrete in one continuous operation until section being placed has been completed. For slab thicknesses greater than 12 inches, prevent excessive segregation of aggregate and high temperatures in accordance with ACI 304 and ACI 308. Place concrete in wall forms in layers not greater than 12 inches in depth, each layer being compacted by internal vibration before succeeding layer is placed.

- J. Place concrete as near as possible to its final position to prevent segregation or loss of materials. Do not use vibrators to transport concrete within forms. Consolidate concrete in walls, columns, beams, and slabs or joist construction thicker than 8" with internal vibrators (8,000 to 12,000 VPM). Slabs less than 8" thick may be consolidated with internal vibrators (9,000 to 13,500 VPM) or vibrating screeds supported on forms, boards, or rails, approved by the Structural Engineer, supplement vibration by forking or spading by hand along surfaces adjacent to forms and construction joints. Be sure an adequate number of operating vibrator units are on hand to properly consolidate quantity of concrete to be placed, including spares for emergency use.
  - 1. Vertically insert and remove handheld vibrators at constant intervals 18 to 30 inches apart. Vibrate concrete the maximum amount and time required for complete consolidation, without segregation, and release of entrapped air bubbles, but in no instance exceed 15 seconds per square foot of exposed surface.
- K. Re-tempering of concrete shall not be permitted. Concrete that has stood more than 15 minutes after leaving the mixer shall be discarded.
- L. Exercise care in placing concrete over waterproof membranes, rigid insulation, and/or protection boards to avoid damaging those materials. Report damage immediately, and do not proceed until damage is repaired.
- M. Remove loose debris from hardened surfaces of previous pours by sandblasting surfaces and expose clean coarse aggregate firmly embedded in cement matrix.
- N. Protect existing concrete work to be exposed to view and other finished materials from damage and staining resulting from concreting operations. Handle concrete carefully to avoid dripping and spillage. Remove spilled concrete from existing surfaces immediately. Covering sills, ledges, and other surfaces with protective coverings may be necessary to protect the work.
- O. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.
- P. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor rods for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- Q. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on the drawings. Screed, tamp, and trowel-finish concrete surfaces.

### 3.5 CONCRETE FINISHES AND TOLERANCES

- A. Exposed Smooth Formed Surfaces: Remove forms and perform necessary repairs and patch to produce surface finish-3.0 as specified in ACI 301. Apply the following to smooth-formed finished concrete exposed to view in the finished work. Confirm finishes with the Architect prior to concrete placement by submitting shop drawings indicating locations of all types of finishes.
  - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.6 CONCRETE SLAB FINISHES AND TOLERANCES

#### A. Trowel Finish:

1. Screed concrete to an even plane, float, then power trowel the surface.
2. Hand trowel the surface smooth and free of trowel marks. Continue hand troweling until a ringing sound is produced as the floor is troweled.
3. Provide trowel finish as indicated on the drawings and at the following locations:
  - a. Concrete floors exposed in finished work unless otherwise indicated.
  - b. Slabs to receive curing compounds and sealers.
  - c. Slabs to receive resilient flooring or carpet.
  - d. Slabs to receive waterproof membranes.

#### B. Fine Broom Finish:

1. Screed concrete to an even plane, float, then power trowel the surface. Provide fine hair broom finish perpendicular to slope, free of loose particles, ridges, projections, voids, and concrete droppings.
2. Provide fine broom finish as indicated on the drawings and at the following locations:
  - a. Stoop slabs.
  - b. Raised curbs and walkway areas.
  - c. Slabs to receive thin set ceramic tile.

#### C. Broom Finish:

1. Screed concrete to an even plane and then float. Immediately after concrete has received a floated finish, give the concrete surface a coarse transverse scored texture by drawing a coarse broom across the surface.
2. Provide as indicated on the drawings and at the following locations:
  - a. ADA ramp slabs.
  - b. Exterior walkway slabs.

#### D. Floor Finish Tolerances: Floor finish tolerances shall be measured by placing a freestanding (unleveled) 10-foot straightedge anywhere on the slab and allowing it to rest upon two high spots within 72 hours after placement of slab and removal of shoring (if present). The gap at any point between the straightedge and the floor (and between the high spots) shall not exceed:

1. Slab on Grade: 1/4"
2. Suspended Slabs: 1/4"

#### E. Slab Drainage: Finish all concrete slabs to proper elevations to ensure that all surface moisture will drain freely to floor drains, and that no puddle areas exist. Contractor shall bear the cost of corrections to provide positive drainage.

#### F. Special Tolerances for Concrete Slabs: No abrupt change in vertical elevation of 1/4" or more is acceptable at the interface between slabs and within areas where pedestrian traffic is expected.

### 3.7 CONCRETE CURING

- A. Freshly placed concrete shall be protected from premature drying and excessively hot temperatures.
- B. Concrete other than high-early strength shall be maintained above 50°F and in a moist condition for at least the first 7 days after placement, except when special curing is used. Special curing procedures shall not be used without written permission from the Structural Engineer.
- C. High-early strength concrete shall be maintained above 50°F and in a moist condition until it has reached 2/3 of the specified 28-day compressive strength, but not less than 3 days unless special curing is used with written permission from the Structural Engineer.
- D. Formed surfaces shall be cured by leaving the formwork in place during the curing period.
- E. Protect concrete from excessive changes in temperature during the curing period and at the termination of the curing process. Changes in the temperature of the concrete shall be as uniform as possible and shall not exceed 5°F in any one hour or 50°F in any 24-hour period.
- F. Protect concrete from injury from the elements until full strength is developed. Protect from mechanical injury.
- G. During cold weather construction, all footings shall be protected from frost penetration until the building is enclosed and temporary heat is provided.

### 3.8 SLAB CURING

- A. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Use one of the methods described below.
- B. Moisture-Retaining-Cover Curing for Concrete Floors Not Exposed in Final Condition: Cover concrete surface with waterproof sheet material as soon as finishing operations are complete and the concrete is sufficiently hard to be undamaged by covering. The cover shall be placed flat on the concrete surface, avoiding wrinkles. Sprinkle concrete with water as necessary during application of covering. Place in widest practicable width, with sides and ends lapped at least 12 inches, and seal with waterproof tape or adhesive. Verify the concrete is continuously wet under the sheets; otherwise, add water through soaker hoses under the sheets. Weight down covering to prevent displacement. Immediately repair any holes or tears during the curing period using polyethylene sheet and waterproof tape. Curing process shall be maintained for a minimum of 7 days.
- C. Moisture-Retaining-Fabric Curing for Concrete Floors to Remain Exposed: Cover concrete surface with moisture retaining fabric as soon as finishing operations are complete and the concrete is sufficiently hard to be undamaged by covering. The cover shall be installed in accordance with the manufacturer's written recommendations, in largest practical widths. Wet the slab to rejection, then thoroughly wet fabric side of cover and install with poly side up. Lap over adjacent covers a minimum of 18". Wet all laps and outside edges to prevent displacement and to ensure intimate contact with concrete and adjacent covers. Rewet as necessary and protect covers from damage during curing process.
  - 1. After minimum 7-day cure, remove moisture retaining fabric in sections.
  - 2. A maximum of 3,500 square feet of concrete curing cover may be removed at any one time. At no time shall the exposed area be permitted to dry prior to completion of the floor scrubbing process.



3. Using a high-powered floor scrubber capable of a minimum 80 pounds head pressure, and a mild citrus-based detergent that does not damage or mar the surface in any way, scrub the floor to remove any minerals or soluble salts that may have accumulated at the floor surface. Rinse area thoroughly with clean fresh water. Remove water and allow floor to dry. If whitening occurs during drying, repeat scrubbing process before floor dries until no whitening occurs during drying.
  4. All areas of the floor shall remain wet during floor scrubbing process. Expose only the amount of floor surface that can be cleaned before any drying occurs without exceeding the maximum allowable exposed area.
- D. Curing Compound: Apply uniformly in continuous operation by low pressure spray equipment or roller as soon as finishing operations are complete, free water on the surface has disappeared, and no water sheen can be seen. Follow the manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period. Verify compatibility of the curing compound with paint, finishes, or toppings that require positive bond to the concrete. If curing compound is not compatible with paint finishes or toppings, utilize a dissipating curing compound and remove in accordance with the manufacturer's recommendations.
- 3.9 PENETRATING LIQUID FLOOR TREATMENTS
- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
  - B. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs in accordance with manufacturer's written instructions.
  - C. Do not apply to concrete that is less than seven days old.
  - D. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
- 3.10 JOINT FILLING
- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
  - B. Do not fill joints until construction traffic has permanently ceased.
  - C. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- 3.11 APPLICATION OF FLOOR SEALER - FINISH COAT
- A. Give concrete floors, as indicated in the Room Finish Schedule and where exposed in finished Work, a second coat of curing and sealing compound immediately prior to Substantial Completion.
  - B. Clean floors and apply sealer strictly according to manufacturer's instructions. Dilution and coverage shall be as recommended by the manufacturer. Apply sealer evenly.

### 3.12 COLD WEATHER CONCRETING

- A. Definition: Cold weather shall be defined as a period when for more than three successive days the average daily outdoor temperature drops below 40°F. The average daily temperature is the average of the highest and lowest temperature during the period from midnight to midnight. When temperatures above 50°F occur during more than half of any 24-hour duration, the period shall not be regarded as cold weather.
- B. All cast-in-place concrete work occurring during cold weather shall conform to all requirements of ACI 306.1, "Standard Specification for Cold Weather Concreting", published by the American Concrete Institute, Detroit, Michigan, except as modified by the contract documents or this specification.
- C. Planning: The General Contractor, concrete contractor, and Architect shall have a pre-construction conference to outline the cold weather concreting operations concerning the placing, finishing, curing and protection of the concrete during cold weather. Pre-construction conference shall occur before cold weather is expected to occur.
- D. Detailed procedure submittal: Concrete contractor shall prepare and submit for review detailed procedures for the production, transportation placement, protection, curing and temperature monitoring of concrete during cold weather. Include procedures to be implemented upon abrupt changes in weather conditions. Do not begin cold weather concreting until these procedures have been reviewed and approved.
- E. Mixing: Concrete flatwork poured in cold weather shall be proportioned to obtain a lower slump to minimize the amount of bleed water during finishing. All bleed water should be skimmed off flatwork prior to troweling. Concrete that will be exposed to cycles of freezing and thawing while saturated should be properly air entrained as outlined in this specification.
- F. Protection of Concrete: Cure and protect concrete against damage from freezing for a minimum period of 72 hours, unless approved by the Structural Engineer. The protection period may be reduced according to ACI 306.1 requirements. Concrete contractor shall submit a letter of request to reduce the protection period, by outlining the method used to achieve the reduction per ACI 306.1.
1. When practical for the construction schedule, formwork shall be insulated and remain in place for at least the required protection period.
- G. Concrete Temperatures: The minimum temperature of concrete immediately after placement shall be as specified in the following table.

Section Size	Minimum temperature of concrete as placed and maintained during the protection period	Maximum gradual decrease in surface temperature during any 24 hours after the end of the protection.	Mixing Temperatures		
			Above 30°F	0 to 30°F	Below 0°F
Less than 12 in	55°F	50°F	60°F	65°F	70°F
12-36 in	50°F	40°F	55°F	60°F	65°F
36-72 in	50°F	30°F	50°F	55°F	60°F
Greater than 72 in	50°F	20°F	45°F	50°F	55°F

- H. **Mixing Temperatures:** As the ambient air temperature decreases, the concrete mixing temperature shall be increased to compensate for the heat lost in the period between mixing and placement. The concrete supplier shall use one or both of the following methods for increasing the concrete temperature.
1. Heating the mixing water to a temperature necessary to offset the temperature losses during transport. Supplier shall not heat water to temperatures in excess of 140°F, without taking special precautions as outlined in ACI 306.
  2. Heating the aggregate with a circulated steam piping system.
- I. **Temperature measurements:** The Contractor shall be responsible for monitoring and recording the concrete temperatures during placement and throughout the protection period.
1. Inspection personnel shall keep a record of the date, time, outside air temperature, temperature of concrete as placed, and weather conditions.
  2. Temperature of the concrete and the outside air shall be recorded at regular intervals but not less than twice in a 24-hour period. The record shall include temperatures at several points within the enclosure and on the concrete surface of sufficient frequency to determine a range of temperatures.
  3. Inspection agency shall submit the temperature logs to the Architect for permanent job records.

### 3.13 HOT WEATHER PROTECTION

- A. **Definition:** Hot weather shall be defined as any combination of high ambient temperature, low relative humidity, high winds, and intense solar radiation that leads to higher than usual evaporation. The table below defines low relative humidity based on air temperature. For a given air temperature, if the relative humidity is equal to or less than the specified minimum, provisions for hot weather concreting shall be as follows:

Air Temperature	Minimum Relative Humidity
105°F	90%
100°F	80%
95°F	70%
90°F	60%
85°F	50%
80°F	40%
<b>75°F</b>	<b>30%</b>

- B. **Scheduling:** When hot weather is expected, adjust concrete placement schedules to avoid placing or finishing during the period from noon until 3:00 pm. When possible, slab pours should be delayed until the building is enclosed to protect the concrete from wind and direct sunlight. The construction schedule shall account for 7-day moist curing period.
- C. **Mixing:** Concrete supplier shall adjust mix designs and admixtures to minimize slump loss. Concrete shall be mixed at a water-cement ratio, which is lower than the specified maximum, to allow for the adjustment of slump by addition of water in the field. Water reduction shall be accomplished without reducing initial slump by increasing dosage of a water reducing admixture.
- D. **Preparation:** Do not order concrete earlier than is required to avoid delays. Cool forms, subgrades and reinforcing bars with water spray from fog nozzle prior to concrete placement.

- E. Delivery: Site traffic shall be coordinated, and delivery times scheduled to minimize waiting times for concrete trucks.
- F. Placement: Preparations shall be made to place and consolidate the concrete at the fastest possible rate. Maintain a continuous flow of concrete to the job site to avoid development of cold joints, during placement of slabs, apply fog spray to prevent moisture loss without causing surplus water to stand on concrete surface.
- G. Finishing: Finish concrete as fast as practical. Continue fogging concrete during finishing. Where fogging is not possible, apply sprayable moisture-retaining film between finishing passes.
- H. Curing: Formed concrete shall be covered with a waterproof material to retain moisture. Flat work shall be moisture cured as described in this specification. Moist curing shall continue for at least 7 days.

#### 3.14 FIELD QUALITY ASSURANCE

- A. Independent Testing Agency and Inspector shall each perform their prescribed inspection, sampling, and testing services as described in Part 1 of this specification section.
- B. In cases where samples have not been taken or tests conducted as specified or strength of laboratory test cylinders for a particular portion of the structure fails to meet requirements of ACI 301, for evaluation of concrete strength, Structural Engineer shall have the right to order compressive or flexural test specimens or both be taken from the hardened concrete according to ASTM C42, load tests according to ACI 318, or such other tests as may be necessary to clearly establish the strength of the in situ concrete, and such tests shall be paid for by the Contractor. Where cores have been cut from the Work, Contractor shall fill voids with dry-pack and patch the finish to match the adjacent existing surfaces.

#### 3.15 REPAIR OF DEFECTIVE AREAS

- A. All repair of defective areas shall be made, with prior approval of Architect and Structural Engineer as to method and procedure, in accordance with Section 5 of ACI 301, except specified bonding compound must be used. Cosmetic repairs of minor defects in exposed concrete surfaces shall be in a manner acceptable to the Architect. Defective areas shall be deemed when:
  - 1. Tests on core or prism specimens fail to show specified strengths.
  - 2. Not formed as indicated or detailed.
  - 3. Not plumb or level where so indicated or required to receive subsequent work.
  - 4. Not true to intended grades and levels.
  - 5. Cut, filled, or resurfaced, unless under direction of the Structural Engineer.
  - 6. Debris is embedded therein.
  - 7. Not fully in conformance with provisions of the drawings.
  - 8. Damaged by hot or cold weather conditions.
  - 9. Mixing time exceeds 90 minutes from ready-mix plant to the time of deposit.
- B. Patch form tie holes at the following locations:
  - 1. Unfinished exposed concrete (not scheduled for painting, plus at board formed concrete finish).
  - 2. All other areas: Prime voids with bonding compound and fill with patching mortar. Strike flush without overlap, float to uniform texture to match adjacent surfaces.

3. Exposed areas scheduled for spray texture:
  - a. Remove projections and protrusions: 1/16" or larger.
  - b. Remove continuous ridges 1/32" or larger.
  - c. Fill voids and pin holes.
4. Exposed areas scheduled for paint or epoxy:
  - a. Remove projections, ridges, and other protrusions 1/32" or larger.
  - b. Fill voids and pin holes 1/16" or larger.
5. Exposed areas not scheduled for paint or other finishes:
  - a. Remove projections, ridges and other protrusions not conforming to requirements specified under Section 03 10 00.
  - b. Fill voids and pin holes not conforming to requirements specified under Section 03 10 00.
- C. All structural repairs shall be made, with prior approval of the Architect/Engineer, as to method and procedure, using the specified epoxy adhesive and/or epoxy mortar.
- D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- E. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
  1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  2. After concrete has cured at least 14 days, correct high areas by grinding.
  3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
  4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

#### 3.16 CEMENT GROUT AND DRY-PACK

- A. Cement Grout: Thoroughly mix sufficient quantities to avoid combining different batches of grout mix. Ensure that grout completely fills all spaces and voids. Level, screed, or cut flush excess grout to produce smooth, neat, even exposed surfaces.
- B. Dry-Pack: Thoroughly blend dry ingredients prior to mixing with water. Forcibly pack mixture to completely fill voids and spaces.

#### 3.17 CLEANING

- A. Clean exposed concrete to remove laitance, efflorescence and stains.

END OF SECTION

## **SECTION 03 35 46 - CONCRETE TOPICAL TREATMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Surface-applied topical concrete sealers.
- B. Related Requirements:
  - 1. Section 03 30 00 "Cast-in-Place Concrete" for coordination of curing and sealing.
  - 2. Section 07 92 00 "Sealants" for floor joint treatments.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.

#### **1.4 FIELD CONDITIONS**

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

### **PART 2 - PRODUCTS**

#### **2.1 LIQUID FLOOR TREATMENTS**

- A. Surface Sealing Floor Treatment (Finish Code CONCS): Clear, non-yellowing, high-solids, low odor, waterborne acrylic polymer curing and sealing compound that provides a protective surface coating, and prevents dusting of concrete surface.
  - 1. Basis of Design: Provide Euclid Chemical; Super Aqua-Cure VOX or equivalent product by one of the following:
    - a. ARDEX Americas.
    - b. Laticrete International, Inc.
    - c. MAPEI Corporation.
    - d. PROSOCO, Inc.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL**

- A. Coordinate with Section 03 30 00 to ensure curing compounds do not interfere with application of concrete topical treatments.
- B. Ensure concrete has cured per topical treatment manufacturer's recommendation.
- C. Review concrete to ensure the surface is clean, dry, and free of deleterious curing compounds and other substances.
  - 1. Report detrimental conditions to the prime contractor and A/E for resolution prior to commencement of work.
  - 2. If existence of prior curing or sealing compounds is unknown, apply a test section in an inconspicuous area.

- D. Prepare concrete according to the topical treatment manufacturer's instructions. Ensure concrete surface temperature, air temperature, and humidity are within manufacturer's allowable range.
  - E. Test surfaces with droplets of water. If water beads and does not penetrate surface, or penetrates only in some areas, profile surfaces by grinding, sanding, or abrasive blasting. Retest and continue profiling surface until water droplets immediately darken and uniformly penetrate concrete surfaces.
- 3.2 SURFACE SEALING FLOOR TREATMENT (CONCS)
- A. Existing Concrete:
    - 1. Remove any previously-applied sealers per manufacturer's recommendation.
    - 2. Clean and dry surface.
  - B. New Concrete:
    - 1. As a cure and seal compound, apply surface sealer when finishing procedures are complete and surface bleed water is no longer present on the concrete. Surface concrete shall be of sufficient strength to not be marred by application of the surface treatment.
    - 2. Apply at the recommended coverage rate using an industrial pump sprayer and backrolling with at 1/4 - inch nap roller, free of ponding and holidays.
- 3.3 PROTECTION
- A. Protect finished floors from traffic until fully cured in accordance with manufacturer's recommendations.
- 3.4 MAINTENANCE
- A. Finished floors shall be maintained by sweeping. Spills shall be cleaned when they occur and dirt rinsed off with water. Heavily soiled areas may be wet-cleaned by mopping or by scrubbing with a rotary floor machine equipped with a scrubbing brush and a suitable, high quality commercial detergent.

END OF SECTION



**DIVISION 04**



## SECTION 04 20 00 - UNIT MASONRY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Concrete masonry units.
  - 2. Steel embed block.
  - 3. Pre-faced concrete masonry units.
  - 4. Clay face brick.
  - 5. Mortar and grout.
  - 6. Steel reinforcing bars.
  - 7. Masonry-joint reinforcement.
  - 8. Ties and anchors.
  - 9. Embedded flashing.
  - 10. Miscellaneous masonry accessories.
- B. Products Installed but not Furnished under This Section:
  - 1. Cast-stone trim in unit masonry.
  - 2. Steel and precast lintels in unit masonry.
  - 3. Steel shelf angles for supporting unit masonry.
  - 4. Cavity wall insulation.
- C. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for coordination with Detention Equipment Contractor of steel embed block locations.
  - 2. Section 04 72 00 "Cast Stone Masonry" for cast stone trim and cladding.
  - 3. Section 07 21 00 "Thermal Insulation" for cavity wall insulation.
  - 4. Section 07 62 00 "Sheet Metal Flashing and Trim" for sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

#### 1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
  - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
  - 2. Stone Trim Units: Show sizes, profiles, and locations of each stone trim unit required.
  - 3. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
  - 4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

- C. Samples for Initial Selection:
    - 1. Pre-faced CMUs.
    - 2. Colored mortar.
    - 3. Weep holes/cavity vents.
  - D. Samples for Verification: For each type and color of the following:
    - 1. Clay face brick, in the form of straps of five or more bricks.
    - 2. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.
    - 3. Weep holes.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For testing agency.
  - B. Material Certificates: For each type and size of the following:
    - 1. Masonry units.
      - a. Include material test reports substantiating compliance with requirements.
      - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
      - c. For exposed brick, include test report for efflorescence according to ASTM C67.
      - d. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
    - 2. Integral water repellent used in CMUs.
    - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
    - 4. Grout mixes. Include description of type and proportions of ingredients.
  - C. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
    - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C109/C109M for compressive strength, ASTM C1506 for water retention, and ASTM C91/C91M for air content.
    - 2. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.
  - D. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602/ACI 530.1/ASCE 6.
  - E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.
- 1.7 QUALITY ASSURANCE
- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
    - 1. Build mockup as shown on Drawings.
    - 2. Clean exposed faces of mockups.
    - 3. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
      - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.

- b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- C. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

#### 1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
  - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe, and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
  - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.
  - 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C1314.

### **2.3 UNIT MASONRY, GENERAL**

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work and will be within 20 feet vertically and horizontally of a walking surface.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
  - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

### **2.4 CONCRETE MASONRY UNITS**

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
  - 2. Provide bullnose units for outside corners unless otherwise indicated.
- B. CMUs: ASTM C90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength as indicated in the Construction Documents.
  - 2. Density Classification: Normal weight.
  - 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
  - 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.
- C. Pre-faced CMUs: Lightweight hollow concrete units complying with ASTM C90, with manufacturer's standard smooth resinous facing complying with ASTM C744.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.

2. Size: Manufactured to dimensions specified in "CMUs" Paragraph but with pre-faced surfaces having 1/16-inch- wide returns of facing to create 1/4-inch- wide mortar joints with modular coursing.
3. Sealer: Provide block with integral sealer, or sealer applied by manufacturer.
4. Colors and Patterns: As selected by Architect from manufacturer's full range.

## 2.5 STEEL EMBED BLOCK

- A. Proprietary Built-in Masonry Anchors: Fabricated from 0.134-inch (3.42-mm) nominal-thickness steel sheet into 8-inch- (203-mm-) deep blocks matching size of concrete masonry units.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. M/BED Block Systems, LLC.
    - b. Peterson Detention Inc. (PDI).
- B. Finish: Factory primed for field painting for anchors with field-welded attachments.

## 2.6 CONCRETE AND MASONRY LINTELS

- A. General: Provide one of the following:
- B. Concrete Lintels: ASTM C1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than that of CMUs.
- C. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

## 2.7 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
  1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
  2. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
  3. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
- B. Clay Face Brick: Facing brick complying with ASTM C216 or hollow brick complying with ASTM C652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area).
  1. Brick Type 1: Cloud Ceramics; Brown Tweed Stadowtex or pre-approved equivalent.
  2. Grade: SW.
  3. Type: FBX.
  4. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested according to ASTM C67.
  5. Efflorescence: Provide brick that has been tested according to ASTM C67 and is rated "not effloresced."
  6. Size (Actual Dimensions): Norman, 3-5/8 inches wide by 2-1/4 inches high by 11-5/8 inches long.
  7. Application: Use where brick is exposed unless otherwise indicated.
  8. Proposed substitutions: Provide face brick matching color range, texture, and size of existing adjacent brickwork.

## 2.8 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91/C91M.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Cemex S.A.B. de C.V.
    - b. Essroc.
    - c. Holcim (US) Inc.
    - d. Lafarge North America Inc.
    - e. Lehigh Hanson; HeidelbergCement Group.
- B. Colored Cement Products: Packaged blend made from masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
  - 1. Colored Masonry Cement:
    - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) Cemex S.A.B. de C.V.
      - 2) Essroc.
      - 3) Holcim (US) Inc.
      - 4) Lafarge North America Inc.
      - 5) Lehigh Hanson; HeidelbergCement Group.
  - 2. Formulate blend as required to produce color as selected from manufacturer's standard colors.
  - 3. Pigments shall not exceed 5 percent of masonry cement by weight.
- C. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- D. Water: Potable.

## 2.9 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60.
- B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.
- C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
  - 1. Interior Walls: Mill- galvanized carbon steel.
  - 2. Exterior Walls: Stainless steel.
  - 3. Wire Size for Side Rods: 0.148-inch diameter.
  - 4. Wire Size for Cross Rods: 0.148-inch diameter.
  - 5. Wire Size for Veneer Ties: 0.148-inch diameter.
  - 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
  - 7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder or truss type with single pair of side rods.



## 2.10 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
  - 1. Stainless Steel Wire: ASTM A580/A580M, Type 304.
  - 2. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304.
  - 3. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.
  - 1. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long may be used for masonry constructed from solid units.
  - 2. Where wythes are of different materials, use adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches.
  - 3. Wire: Fabricate from 3/16-inch- diameter, stainless steel wire.
- D. Partition Top Anchors: 0.105-inch- thick metal plate with a 3/8-inch- diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from stainless steel.
- E. Adjustable Masonry-Veneer Anchors:
  - 1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
  - 2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.078-inch- thick, stainless steel sheet.
  - 3. Fabricate wire ties from 0.187-inch- diameter, stainless steel wire unless otherwise indicated.
  - 4. Screw-Attached, Masonry-Veneer Anchors: Wire tie and a gasketed sheet metal anchor section, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom; top and bottom ends bent to form pronged legs of length to match thickness of insulation or sheathing; and raised rib-stiffened strap, 5/8 inch wide by 6 inches long, stamped into center to provide a slot between strap and base for inserting wire tie. Self-adhering, modified bituminous gasket fits behind anchor plate and extends beyond pronged legs.
  - 5. Polymer-Coated, Steel Drill Screws for Steel Studs: ASTM C954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 diameter by length required to penetrate steel stud flange with not less than three exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours according to ASTM B117.

## 2.11 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
  - 1. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.016 inch thick.
  - 2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.
  - 3. Fabricate through-wall flashing with drip edge where indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
  - 4. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
  - 5. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

- B. Flexible Flashing: Comply with requirements in Section 07 65 00 for flexible stainless steel flashing.
  - C. Application: Unless otherwise indicated, use the following:
    - 1. Where flashing is indicated to receive counterflashing, use metal flashing.
    - 2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
    - 3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing or flexible flashing with a metal drip edge.
    - 4. Where flashing is fully concealed, use flexible flashing.
  - D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
  - E. Termination Bars for Flexible Flashing: Stainless steel bars 0.075 inch by 1 inch.
- 2.12 MISCELLANEOUS MASONRY ACCESSORIES
- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neopreneurethane or PVC.
  - B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D2000, Designation M2AA-805 or PVC, complying with ASTM D2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
  - C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D226/D226M, Type I (No. 15 asphalt felt).
  - D. Weep/Cavity Vent Products: Use the following unless otherwise indicated:
    - 1. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer's standard.
      - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
        - 1) Advanced Building Products Inc.
        - 2) CavClear/Archovations, Inc.
        - 3) Mortar Net Solutions.
  - E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
    - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      - a. Advanced Building Products Inc.
      - b. CavClear/Archovations, Inc.
      - c. Mortar Net Solutions.
    - 2. Configuration: Provide one of the following:
      - a. Strips, full depth of cavity and 10 inches high, with dovetail-shaped notches 7 inches deep that prevent clogging with mortar droppings.

## 2.13 MASONRY CLEANERS

- A. Products: Provide products and methods approved by brick and mortar manufacturers and having no deleterious effect on appearance and performance of brick and mortar.

## 2.14 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use masonry cement mortar unless otherwise indicated.
  - 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated.
  - 1. For masonry below grade or in contact with earth, use Type M.
  - 2. For reinforced masonry, use Type S.
  - 3. For exterior, above-grade, load-bearing and nonload-bearing walls and parapet walls; for interior load-bearing walls; for interior nonload-bearing partitions; and for other applications where another type is not indicated, use Type S.
  - 4. For interior nonload-bearing partitions, Type O may be used instead of Type N.
- D. Pigmented Mortar: Use colored cement product.
  - 1. Pigments shall not exceed 5 percent of masonry cement by weight.
  - 2. Mix to match Architect's sample.
  - 3. Application: Use pigmented mortar for exposed mortar joints with the following units:
    - a. Pre-faced CMUs.
    - b. Clay face brick.
    - c. Cast-stone trim units.
- E. Grout for Unit Masonry: Comply with ASTM C476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
  - 2. Proportion grout in accordance with ASTM C476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
  - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C143/C143M.
- F. Bentonite Grout: Bentonite/polymer waterproofing grout.
  - 1. Manufacturers: subject to compliance with requirements, provide AVM Industries, Inc.; AVM Aussie Grout 907 or equivalent product by:
    - a. Mineral Technologies/Cetco
  - 2. Permeability:  $1 \times 10^{-7}$  to  $1 \times 10^{-9}$  cm/sec per ASTM D5084.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
  - 2. Verify that foundations are within tolerances specified.
  - 3. Verify that reinforcing dowels are properly placed.
  - 4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION, GENERAL**

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C67. Allow units to absorb water so they are damp but not wet at time of laying.

### **3.3 TOLERANCES**

- A. Dimensions and Locations of Elements:
  - 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
  - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
  - 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
  - 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
  - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
  - 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.

4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
  1. Install compressible filler in joint between top of partition and underside of structure above.
  2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.
  3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 07 84 43 "Joint Firestopping."

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
  - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
  - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
  - 4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
  - 5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.
- B. Lay solid masonry units and hollow brick with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Set cast-stone trim units in full bed of mortar with full vertical joints. Fill dowel, anchor, and similar holes.
  - 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
  - 2. Allow cleaned surfaces to dry before setting.
  - 3. Wet joint surfaces thoroughly before applying mortar.
  - 4. Rake out mortar joints for pointing with sealant.
- D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- E. Cut joints flush where indicated to receive air barriers unless otherwise indicated.

### 3.6 CAVITY WALLS

- A. Bond wythes of cavity walls together as follows:
  - 1. Masonry-Joint Reinforcement: Installed in horizontal mortar joints.
    - a. Where one wythe is of clay masonry and the other of concrete masonry, use adjustable-type (two-piece-type) reinforcement to allow for differential movement regardless of whether bed joints align.
- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- C. Installing Cavity Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
  - 1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

### 3.7 ANCHORED MASONRY VENEERS

- A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
  - 1. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
  - 2. Embed tie sections in masonry joints.

3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  4. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.
- B. Provide not less than 2 inches of airspace between back of masonry veneer and face of insulation.
1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.
- 3.8 MASONRY-JOINT REINFORCEMENT
- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
1. Space reinforcement not more than 16 inches o.c.
  2. Provide reinforcement in first and second horizontal joints above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- 3.9 CONTROL AND EXPANSION (MOVEMENT) JOINTS
- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Fully-grouted and reinforced masonry walls shall not require movement joints. In all other instances, install joints as shown on drawings and:
1. Horizontal separation of vertical movement joints shall not exceed 24 feet.
  2. Joints shall be spaced so that the combined distance of joints to either side of outside corners shall not exceed 24 feet.
  3. Height to width aspect ratio of masonry (area contained by edges, movement joints and bond breakers) shall not exceed 1:1.5.
  4. Form control joints at all masonry facade inside corners unless directed otherwise.
- C. Form control joints in concrete masonry as follows:
1. Install preformed control-joint gaskets designed to fit standard sash block.
- D. Form expansion joints in brick as follows:
1. Form open joint full depth of brick wythe and of width indicated, but not less than 1/2 inch for installation of sealant and backer rod specified in Section 07 92 00 "Joint Sealants."
  2. Form joints wider than 1/2 inch where indicated on drawings.
- E. Provide horizontal, pressure-relieving joints by inserting a compressible filler of width required for installing sealant and backer rod specified in Section 07 84 43 or Section 07 92 00 "Joint Sealants" as appropriate to the location, but not less than 1/2 inch.
1. Locate horizontal, pressure-relieving joints where non-bearing construction meets floor and roof.

### 3.10 LINTELS

- A. Install steel lintels where indicated.
- B. Provide concrete or masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
  - 1. Use specially shaped lintel units at hollow masonry unit walls, with reinforcing bars as shown and filled with concrete grout.
  - 2. Place and consolidate concrete without disturbing the reinforcing.
  - 3. Allow lintels to reach 100 percent of their design strength before removing temporary supports.
  - 4. Do not place vertical control joints through bond beams. Place the vertical control joints at each end of the bond beam lintel.
- C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

### 3.11 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape.
  - 2. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under air barrier, lapping at least 4 inches. Fasten upper edge of flexible flashing to sheathing through termination bar.
  - 3. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
  - 4. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall, and adhere flexible flashing to top of metal flashing termination.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
  - 1. Use specified weep/cavity vent products to form weep holes.
  - 2. Space weep holes 24 inches o.c. unless otherwise indicated.
- E. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.
- F. Install cavity vents in head joints in exterior wythes at spacing indicated. Use specified weep/cavity vent products to form cavity vents.

### 3.12 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.



1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
  2. Limit height of vertical grout pours to not more than 60 inches.
- 3.13 BENTONITE GROUT WATERPROOFING
- A. Install bentonite grout in lifts as recommended by manufacturer.
- B. Ensure a minimum thickness of 1/2 inch of bentonite grout throughout the installation. Install bentonite grout continuous from top of assembly to footing.
- C. Detail transitions to adjacent construction as recommended by manufacturer to maintain continuity of waterproofing.
- 3.14 REPAIRING, POINTING, AND CLEANING
- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  3. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  4. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.
  5. Clean cast stone trim to comply with stone supplier's written instructions.

END OF SECTION

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## SECTION 04 72 00 - CAST STONE MASONRY

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Wall panels.
  - 2. Trim units.
  - 3. Mortar materials.
  - 4. Accessories.

#### 1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. For cast stone units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.
  - 1. Include building elevations showing layout of units and locations of joints and anchors.
- C. Samples for Verification:
  - 1. For each color and texture of cast stone required, 4 inches square in size.
  - 2. For each trim shape required, 4 inches in length.
  - 3. For colored mortar, make Samples using same sand and mortar ingredients to be used on Project.

#### 1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
  - 1. Include copies of material test reports, indicating compliance of cast stone with ASTM C1364.
- B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C1364.
  - 1. Provide test reports based on testing within previous six months.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer of cast stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, manufacturer is a member of the Cast Stone Institute and/or is a plant certified by CSI, APA or PCI for Group A, Category AT.
- B. Furnish cast stone for installation in mockups specified in Section 04 20 00 "Unit Masonry."

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate delivery of cast stone with unit masonry work to avoid delaying the Work.
- B. Pack, handle, and ship cast stone units in suitable packs or pallets.
  - 1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast stone units if required, using dollies with wood supports.
  - 2. Store cast stone units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.

- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store mortar aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

## 1.6 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements in TMS 602.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until cast stone has dried, but no fewer than seven days after completing cleaning.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements in TMS 602.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations for Cast Stone: Obtain cast stone units from single source from single manufacturer.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

### 2.2 CAST STONE MATERIALS

- A. General: Comply with ASTM C1364.
- B. Portland Cement: ASTM C150/C150M, Type I or Type III, containing not more than 0.60 percent total alkali when tested according to ASTM C114. Provide natural color or white cement as required to produce cast stone color indicated.
- C. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C33/C33M; gradation and colors as needed to produce required cast stone textures and colors.
- D. Fine Aggregates: Natural sand or crushed stone complying with ASTM C33/C33M, gradation and colors as needed to produce required cast stone textures and colors.
- E. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
- F. Admixtures: Use only admixtures specified or approved in writing by Architect.
  - 1. Do not use admixtures that contain more than 0.1 percent water-soluble chloride ions by mass of cementitious materials. Do not use admixtures containing calcium chloride.
  - 2. Use only admixtures that are certified by manufacturer to be compatible with cement and other admixtures used.
  - 3. Air-Entraining Admixture: ASTM C260/C260M. Add to mixes for units exposed to the exterior at manufacturer's prescribed rate to result in an air content of 4 to 6 percent, except do not add to zero-slump concrete mixes.
  - 4. Water-Reducing Admixture: ASTM C494/C494M, Type A.
  - 5. Water-Reducing, Retarding Admixture: ASTM C494/C494M, Type D.
  - 6. Water-Reducing, Accelerating Admixture: ASTM C494/C494M, Type E.
- G. Reinforcement:

1. Deformed steel bars complying with ASTM A615/A615M, Grade 40. Use galvanized or epoxy-coated reinforcement when covered with less than 1-1/2 inches of cast stone material.
  2. Galvanized-Steel, Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from galvanized-steel wire into flat sheets.
  3. Fiber Reinforcement: ASTM C1116/C1116M.
- H. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666, Type 304.

## 2.3 CAST STONE UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or pre-approved equivalent:
1. Edwards Cast Stone.
  2. Midwest Cast Stone.
  3. Architectural Cast Stone.
  4. Custom Cast Stone.
- B. Cast Stone Units: Comply with ASTM C1364.
1. Units are manufactured using the manufacturer's selected method.
  2. Wall Panels: Sizes as indicated on Drawings.
  3. Trim units including items as indicated on Drawings.
- C. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.
1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
  2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
  3. Provide drips on projecting elements unless otherwise indicated.
- D. Fabrication Tolerances:
1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
  2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.
  3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.
  4. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch on formed surfaces of units and 3/8 inch on unformed surfaces.
- E. Cure Units as Follows:
1. Cure units in enclosed, moist curing room at 95 percent relative humidity and temperature of 100 deg F for 12 hours or 70 deg F for 16 hours.
  2. Keep units damp and continue curing to comply with one of the following:
    - a. No fewer than five days at mean daily temperature of 70 deg F or above.
    - b. No fewer than seven days at mean daily temperature of 50 deg F or above.
- F. Acid etch units after curing to remove cement film from surfaces to be exposed to view.
- G. Colors and Textures: Match Architect's sample based on Edwards Cast Stone reference sample DC19, a light tan color.

## 2.4 MORTAR MATERIALS

- A. Water: Potable.

## 2.5 ACCESSORIES

- A. Anchors: Type and size indicated, fabricated from Type 304 stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666.
- B. Dowels: 1/2-inch- diameter round bars, fabricated from Type 304 stainless steel complying with ASTM A240/A240M, ASTM A276/A276M, or ASTM A666.

## 2.6 MORTAR MIXES

- A. Comply with requirements in Section 04 20 00 "Unit Masonry" for mortar mixes.

## 2.7 SOURCE QUALITY CONTROL

- A. Engage a qualified independent testing agency to sample and test cast stone units according to ASTM C1364.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 SETTING CAST STONE IN MORTAR

- A. Set cast stone as indicated in TMS 604 unless more stringent criteria are listed.
- B. Install cast stone units to comply with requirements in Section 04 20 00 "Unit Masonry."
- C. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
  - 1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
  - 2. Coordinate installation of cast stone with installation of flashing specified in other Sections.
- D. Wet joint surfaces thoroughly before applying mortar or setting in mortar.
- E. Set units in full bed of mortar with full head joints unless otherwise indicated.
  - 1. Build anchors and ties into mortar joints as units are set.
  - 2. Fill dowel holes and anchor slots with mortar.
  - 3. Fill collar joints solid as units are set.
  - 4. Build concealed flashing into mortar joints as units are set.
  - 5. Keep head joints in copings and between other units with exposed horizontal surfaces open to receive sealant.
  - 6. Keep joints at shelf angles open to receive sealant.
- F. Vertical Joints: Tool exposed joints slightly concave when thumbprint hard. Use a smooth plastic jointer larger than joint thickness.
- G. Horizontal Joints: Rake out joints for pointing with sealant to depths of not less than 3/4 inch. Scrub faces of units to remove excess mortar as joints are raked.
- H. Point joints with sealant to comply with applicable requirements in Section 07 92 00 "Joint Sealants."

1. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
  - I. Provide sealant joints at head joints of copings and other horizontal surfaces; at expansion, control, and pressure-relieving joints; and at locations indicated.
    1. Keep joints free of mortar and other rigid materials.
    2. Build in compressible foam-plastic joint fillers where indicated.
    3. Form joint of width indicated, but not less than 3/8 inch.
    4. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
    5. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 07 92 00 "Joint Sealants."
- 3.3 INSTALLATION TOLERANCES
- A. Variation from Plumb: Do not exceed 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2 inch maximum.
  - B. Variation from Level: Do not exceed 1/4 inch in 10 ft., 3/8 inch in 20 ft., or 1/2 inch maximum.
  - C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.
  - D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except where variation is due to warpage of units within tolerances specified.
- 3.4 ADJUSTING AND CLEANING
- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.
  - B. Replace units in a manner that results in cast stone matching approved Samples, complying with other requirements, and showing no evidence of replacement.
  - C. In-Progress Cleaning: Clean cast stone as work progresses.
    1. Remove mortar fins and smears before tooling joints.
    2. Remove excess sealant immediately, including spills, smears, and spatter.
  - D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:
    1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
    2. Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.
    3. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
    4. Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
    5. Clean cast stone by methods described in Cast Stone Institute Technical Bulletin #39.

END OF SECTION

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## **DIVISION 05**



## SECTION 05 05 53 - SECURITY METAL FASTENINGS

### PART 1 - GENERAL

#### 1.1 DESCRIPTION

- A. Exposed security fasteners used in the manufacture, fabrication and installation of products, equipment, systems and components for use in areas of project accessible to inmates, shall be security fasteners, except at the following excluded locations and as otherwise indicated.
  - 1. Mechanical, electrical, generator and communications equipment and rooms, including roof mounted equipment.
  - 2. Control rooms and attendant equipment within control rooms, except control panels.
  - 3. Above suspended ceilings, behind access panels and within pipe and duct chases.
  - 4. Toilet partitions and non-security plumbing fixtures.
  - 5. Moveable furnishings, storage shelving, cabinet hardware.
  - 6. Wall board screws.
  - 7. Areas of project not accessible to inmates.

#### 1.2 RELATED WORK AND REQUIREMENTS

- A. Applicable provisions of Division 01 shall govern Work of this Section.
- B. Section 01 35 13.16: Special Project Procedures for Detention Facilities
- C. Divisions 2 through 28, inclusive, for areas accessible to inmates.

#### 1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data for each type of security fastener required substantiating that products comply with requirements.
- B. Samples: Submit three samples of each type of security fastener required.

#### 1.4 QUALITY ASSURANCE

- A. Security Fasteners: Operable by tools produced for use on specified security fasteners by fastener manufacturer or fabricators licensed by them.
- B. Single Source Responsibility: Obtain each type of security fastener from a single manufacturer.
- C. Security fasteners specified herein shall be obtained by manufacturers, supplier and installer of each component requiring their use. It shall be their collective responsibility to ensure use of proper size and type of security fastener for each required application, and to coordinate with each other to ensure that quantity of tools required does not exceed specified maximum. Such coordination shall include sufficient provision of information to DEC to indicate tool quantities specified are not exceeded.
- D. Provide coordination and control to ensure that security fasteners used are operable by a single set of tools for entire project.

#### 1.5 MAINTENANCE MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Security Fasteners: Furnish not less than one box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.
- C. Tools: Provide two sets of tools for installing and removing security fasteners.

## **PART 2 - PRODUCTS**

### **2.1 SECURITY FASTENERS**

- A. Operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific type of fastener. Drive-system type, head style, material, and protective coating as required for assembly, installation, and strength, and as follows:
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Acument Global Technologies; Acument Intellectual Properties, LLC.
  - 2. Bryce Fastener
  - 3. Safety Socket LLC
  - 4. Tamperproof Screw Co., Inc.
  - 5. Tamper-Pruf Screws
- C. Drive-System Type: Pinned Torx or Pinned Torx-Plus.
- D. Fastener Strength: 120,000 psi.
- E. Socket Button Head Fasteners:
  - 1. Heat-treated alloy steel, ASTM F 835.
  - 2. Stainless steel, ASTM F 879, Group 1 CW.
- F. Socket Flat Countersunk Head Fasteners:
  - 1. Heat-treated alloy steel, ASTM F 835.
  - 2. Stainless steel, ASTM F 879, Group 1 CW.
- G. Socket Head Cap Fasteners:
  - 1. Heat-treated alloy steel, ASTM A 574.
  - 2. Stainless steel, ASTM F 837, Group 1 CW.
- H. Protective Coatings for Heat-Treated Alloy Steel:
  - 1. Zinc and clear trivalent chromium where indicated.
  - 2. Zinc phosphate with oil, ASTM F 1137, Grade I, or black oxide unless otherwise indicated.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install security fasteners in accordance with manufacturer's instructions using proper tools and procedures.
- B. Security fasteners shall be obtained by manufacturer, supplier and installer of each component requiring their use. Each entity is responsible to ensure proper size and type of security fastener for each required application.
- C. Security fastener installation shall be performed by entity that would install fastener under normal application conditions including those used in factory assembly of equipment.
- D. Fasten equipment, products, and components to each other and to building construction as detailed or as otherwise required to provide a secure, permanent installation. Unless otherwise indicated, provide fasteners of the same material and finish as the equipment, product or component to which they connect.

- E. Where fastening spacings and sizes are not indicated, use spacings and sizes of fasteners that will develop the full strength of the members being fastened. Failure due to over stressing must occur in the members before occurring in the fastenings.

End of Section

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## SECTION 05 12 23 - STRUCTURAL STEEL

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Fabrication and erection of structural steel work, as shown on the drawings and specified herein. Work shall include, but not be limited to the following items:
  - 1. Structural steel.
  - 2. Base and bearing plates.
  - 3. Deck support angles and framing for roof openings.
  - 4. Steel lintel members for masonry openings.
  - 5. Edge angles and bent plates.
  - 6. Connection plates.
  - 7. Shear stud connectors.
  - 8. All other steel items as listed in AISC - "Code of Standard Practice for Steel Buildings and Bridges" as shown on structural and architectural drawings.
- B. Work shall also include grouting of all structural steel members where indicated.
- C. Structural notes indicated on the drawings regarding structural steel framing should be considered a part of this specification.

#### 1.2 RELATED WORK

- A. Pertinent Sections of Division 01.
- B. Section 03 30 00 - Cast-in-Place Concrete.
- C. Section 05 31 00 - Steel Deck.
- D. Section 05 40 00 - Cold-Formed Steel Framing Systems.
- E. Section 05 50 00 - Metal Fabrications.
- F. Section 05 51 00 - Metal Stairs.

#### 1.3 REFERENCES

- A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
  - 1. AISC - Specification for Structural Joints Using High-Strength Bolts.
  - 2. AISC 303 - Code of Standard Practice for Buildings and Bridges.
  - 3. AISC 360-10 - Specification for Structural Steel Buildings.
  - 4. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 5. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - 6. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 7. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
  - 8. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.

9. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
10. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
11. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
12. ASTM A992 - Standard Specification for Steel for Structural Steel Shapes.
13. ASTM A1085 - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS).
14. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
15. ASTM E94 - Standard Guide to Radiographic Examination Using Industrial Radiographic Film.
16. ASTM E165 - Standard Practice for Liquid Penetrant Examination for General Industry.
17. ASTM E709 - Standard Guide for Magnetic Particle Testing.
18. ASTM F436 - Standard Specification for Hardened Steel Washers.
19. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.
20. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
21. ASTM F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength, Inch Dimensions.
22. AWS D1.1 - Structural Welding Code - Steel.
23. SSPC - Steel Structures Painting Council.

#### 1.4 QUALITY ASSURANCE

##### A. Fabrication, Erection, and Welding Qualifications:

1. Fabricate structural steel members in accordance with AISC Specification for the design, fabrication, and erection of structural steel for buildings.
2. Steel fabricator shall not have less than five (5) years of continuous experience in fabrication of structural steel framing.
3. Steel erector shall not have less than five (5) years of continuous experience in the erection of structural steel framing.
4. All welding of structural steel shall be performed by operators who have been recently qualified as prescribed in "Qualification Procedures" of the American Welding Society (AWS).
5. Tolerances: Tolerances shall be as indicated by the AISC Code of Standard Practice for Buildings and Bridges, except that tolerances for fabricating, rolling, cambering and erection shall not be cumulative.

#### 1.5 SUBMITTALS

##### A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer's approval, including framing plans indicating size, weight, and location of all structural members. Shop drawings shall indicate methods of connecting, anchoring, fastening, bracing, and attaching work of other trades.
  - a. Where contract documents indicate verify in field (VIF) dimensions, shop drawings shall indicate these dimensions and Contractor shall note the dimensions have been verified.



- b. This specification modifies AISC Code of Standard Practice by deleting the following sentence from 4.4.1(c): "Release by the Owner's Designated Representatives for Design and Construction for the Fabricator to begin fabrication using the approved submittals." Review of the shop drawings by the Engineer shall not relieve the fabricator of this responsibility.
  - 2. Furnish both the Engineer and Architect with one copy of the following:
    - a. Final shop drawings containing all review notations.
    - b. Field Use/For Construction drawings.
  - 3. The steel fabricator shall submit a setting plan for all embedded items for Engineer's approval.
  - 4. Welder's Certification: Submit certification for all welders employed on the project demonstrating they have been AWS qualified to perform the welding procedures required for this project.
  - 5. General Contractor/Construction Manager to provide copies of field concrete cylinder breaks indicating the concrete meets 75% of the design compressive strength to the steel erector.
- B. The General Contractor/Construction Manager shall conduct a field survey of as-built anchors and bearing plate locations and elevations prior to steel erection. Survey shall be furnished to the steel fabricator. Contractor shall identify deviations from approved shop drawings and submit proposed repairs and modifications to the Engineer and steel fabricator for approval.
- C. Product Data:
- 1. Certified copies of material test reports, commonly called mill test reports, for all structural steel used on the project. Material test reports shall comply with the requirements of ASTM A6, shall cover chemical and physical properties, and shall be accompanied by a Certificate of Compliance from the fabricator.
  - 2. Manufacturer specifications, certifications, and installation recommendations for the following products, including laboratory test reports and other data required to prove compliance with these specifications:
    - a. High strength bolts, including nuts and washers.
    - b. Unfinished bolts and nuts
  - 3. The Contractor shall submit written procedures for the pre-installation testing, installation, snugging, pretensioning, and post-installation inspection of fasteners. The procedure(s) shall meet all requirements of the RCSC specification and the drawings. Procedures need to be submitted only for the method(s) of installation to be used by the Contractor, which may include the turn-of-nut, calibrated wrench, twist-off type tension control bolt, and direct tension indicator methods.
  - 4. Shear Stud Connectors: Contractor shall submit the following:
    - a. Certifications that the studs, as supplied, meet the requirements of AWS D1.1, Sections 7.2 and 7.3.
    - b. Certified copies of the stud manufacturer's test reports covering the last completed set of in-plant quality control mechanical tests for the diameter supplied.
    - c. Certified material test reports from the steel supplier indicating diameter, chemical properties, and grade on each heat number supplied.
    - d. Certificate of Compliance from the Contractor.

5. Prepare and submit product data for Engineer's approval for shop applied primers, finished paint system, expansion and/or adhesive anchors, non-shrink grout and other miscellaneous materials.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Steel members shall be transported, stored, and erected in a manner that will avoid any damage or deformation. Materials should be stored to allow easy access for inspection and identification. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of the ground and in such a manner as to eliminate excessive handling.
- B. Store fasteners in a protected location. Clean and re-lubricate bolts and nuts before use.

### **PART 2 - PRODUCTS**

#### 2.1 MATERIALS

##### A. Structural Steel:

1. All structural steel shall be free from defects impairing strength, durability, or appearance. All structural steel shall meet the latest minimum requirements as follows:
  - a. Structural steel wide flange shapes shall:
    - 1) Conform to the ASTM designations listed in the General Notes of the drawings, unless noted otherwise.
  - b. Structural steel angles, channels, plates and miscellaneous steel shall conform to the ASTM designations listed in the General Notes of the drawings.
  - c. Square and rectangular structural tubing shall be cold formed conforming to the ASTM designations listed in the General Notes of the drawings.
  - d. Round structural tubing shall be cold formed conforming to the ASTM designations listed in the General Notes of the drawings.

##### B. High Strength Structural Bolts:

1. High strength structural bolts shall conform to the ASTM designations listed in the General Notes of the drawings.
2. High strength bolts shall be detailed and installed in accordance with AISC - "Specification for Structural Joints Using High-Strength Bolts."
3. Manufacturer's symbol and grade markings shall appear on all bolts and nuts.

##### C. Anchoring Devices:

1. Anchor Rods: Anchor rods used with structural steel members shall be plain threaded rods conforming to the ASTM designations listed in the General Notes of the drawings.
2. Expansion Anchors: Expansion anchors shall consist of one-piece wedge type carbon steel anchors with heavy-duty nuts and washers. All components shall be zinc plated in accordance with ASTM B633. Refer to the drawing details and General Notes for the expansion anchors used as the basis of design and the acceptable alternates.

3. Adhesive Anchoring System: Adhesive anchoring system shall consist of a threaded anchor rod complete with nut and washer and the adhesive cartridge. Refer to the drawing details and General Notes for the adhesive anchoring systems used as the basis of design and the acceptable alternates.
  - a. Nuts shall meet ASTM A563, Grade DH, and washers shall meet ASTM F436.
  - b. All components shall be zinc plated in accordance with ASTM B633 SC1.
  - c. Adhesive shall consist of a two-part acrylic based adhesive applied in a dual cartridge dispensing system that properly mixes the components at the point of application.
- D. Welding Materials:
  1. Type required for material being welded in conformance with AWS D1.1.
- E. Steel Stud Connectors:
  1. For threaded studs that are being used to connect steel beams to embed plates, use ASTM A108, Type A, Grades 1010 through 1020 forged steel, headed uncoated with a minimum tensile strength of 61,000 psi. Fabricated within the tolerances set forth in AWS D1.1.
  2. For shear connectors that are being used on steel beams in concrete slabs for composite shear transfer and embedded steel members, use ASTM A108, Type B, Grades 1010 through 1020 forged steel, headed uncoated with a minimum tensile strength of 65,000 psi. Fabricated within the tolerances set forth in AWS D1.1
  3. Studs applied by means of the electric arc welding process and shall use an arc shield ferrules of heat resistant ceramic.
- F. Galvanizing: Where indicated on the drawings, steel shall be galvanized by the hot-dip process after fabrication conforming to ASTM A123. All exterior steel that will remain exposed shall be galvanized, unless otherwise indicated.
- G. Paints and Primers:
  1. Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.
  2. Galvanizing repair paint: SSPC Paint 20.
  3. Refer to Specification Section 09 90 00 for additional paint requirements.
- H. Non-Shrink Grout for Base and Bearing Plates: Non-shrink grout, conforming to ASTM C1107, shall be pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sand, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents. All constituents shall meet the requirements of these specifications. Minimum compressive strength at 28-days shall be 7,000 psi as determined by ASTM C109. Follow manufacturer's instructions for handling, mixing, placing, and curing. Acceptable products are:
  1. Euclid Chemical Company - Euco N.S. Grout
  2. L&M Construction Chemical - Crystex.
  3. Master Builders - Masterflow 713.
  4. Sonneborn - SonnogROUT.
  5. Five Star Products Inc. - Five Star Grout.
  6. Dayton Superior - Sure-Grip High Performance Grout.
  7. Dayton Superior - 1107 Advantage Grout.

## 2.2 FABRICATION AND MANUFACTURE

### A. Fabrication Procedures (non-AESS):

1. Fabricate all structural steel items in accordance with AISC Specifications and as indicated on the approved shop drawings.
2. Provide camber in structural members where indicated.
3. Properly mark materials for field assembly and location for which intended. Fabricate for delivery sequence that will expedite erection and minimize handling of materials.
4. Complete structural steel assemblies before shop priming or galvanizing.

### B. Shop Connections:

1. All shop connections shall be welded, unless noted otherwise on drawings. Connections shall develop the full strength of the adjoining members unless detailed otherwise.
2. All holes shall be either drilled or punched, as no burning of holes will be permitted, including the enlargement of holes. Provide all holes required for connections and for attaching the work of other trades where such holes are shown if furnished prior to fabrication.
3. Connections shall be detailed as standard framed beam connections (bearing type) in accordance with the AISC Manual of Steel Construction. Connections which require oversized holes or slotted holes in which the force is other than normal to the axis of the slot shall be detailed as "Slip-Critical Connections" and noted as such on the erection drawings. Provide bearing plates and end anchorage for beams resting on masonry.
4. All full and partial penetration welds shall be fully detailed on the shop drawings. Use backing for all full penetration welds.
5. Weld access holes shall be fabricated in accordance with the recommendations of AWS D1.1 and AISC Specification.

### C. Steel Stud Connectors:

1. Steel stud shear connectors shall be securely welded in the field to structural steel beams as detailed on the drawings. Welds shall be such that the stud connector will deform before weld failure occurs. Welding shall be done in accordance with AWS D1.1.
2. Steel stud connectors for embedded plates and angles shall be welded in the fabrication shop in accordance with AWS D1.1.

### D. Deck support framing and seats: Furnish all miscellaneous framing necessary to fully support the roof and floor steel decking.

### E. Shop Priming:

1. Unless noted otherwise below, structural steel shall not be shop primed.
2. The following are steel surfaces to receive shop priming:
  - a. Surfaces outside the building envelope that are not galvanized.
  - b. Surfaces to be painted per Architect's drawings.
3. If the steel pieces are to be shop primed, the following surfaces are exceptions to shop priming:
  - a. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
  - b. Surfaces to be field welded.

- c. Surfaces to be high-strength bolted with slip-critical connections.
    - d. Top flanges of beams supporting composite steel decking.
    - e. Surfaces to receive sprayed fire-resistive materials.
    - f. Galvanized surfaces.
  - 4. Surface Preparation: Clean Surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
    - a. SSPC-SP 3, "Power Tool Cleaning."
  - 5. Priming: Apply primer in accordance with paint manufacturer's recommendations, and at a rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
- F. Finished Paint System:
- 1. Finished paint coats shall be in accordance with paint manufacturer's recommendations and Division 9.
  - 2. Paint shall be free of sags, runs, drips or other defects. Allow ample drying time before handling to prevent damage to coatings.
  - 3. Strip paint corners, crevices, bolts, welds, and sharp edges.
  - 4. Apply two coats of shop paint to surfaces that will be inaccessible after assembly or erection. Change color of the second coat to distinguish it from the first.
- G. Finished Paint System for Exposed Structural Steel: Structural steel exposed to the elements of weather shall be painted as follows:
- 1. Apply one coat of steel primer in shop as specified above.
  - 2. Apply two coats of alkyd enamel paint to a minimum dry film thickness of 1.5 mils for each coat. Paint shall be applied according to the manufacturer's recommendations.
  - 3. Paint shall be free of sags, runs, drips or other defects. Allow ample drying time before handling to prevent damage to coatings.
- H. Galvanizing:
- 1. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123.
    - a. Fill vent holes and grind smooth after galvanizing.
    - b. Unless otherwise noted on drawings or in Division 9, all exterior steel components exposed to the elements shall be galvanized, including, but not limited to, lintels.

### **PART 3 - EXECUTION**

#### **3.1 SURFACE CONDITIONS**

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 ERECTION

#### A. Erection Procedures:

1. The erector and not the Structural Engineer shall be responsible for the means, methods, and safety of erection of the structural steel framing.
2. Erection of all structural steel items shall meet the requirements of AISC "Specification and Code of Standard Practice."
3. All work shall be erected square, plumb, straight and true, accurately fitted and with tight joints and intersections, by mechanics experienced in the erection of structural steel. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
4. Clean the bearing surface and other surfaces that will be in permanent contact before assembly.
5. All base plates shall be supported on steel wedges, steel shims or heavy-duty leveling nuts until the supported members have been leveled and plumbed.
  - a. Snug tighten anchor rods after supported members have been positioned and plumb. Do not remove wedges or shims but, if protruding, cut off flush with edge of base plate before packing with grout.
  - b. Promptly place non-shrink grout between bearing surfaces and base plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturers written installation instructions for shrinkage-resistant grouts.
6. Field connections of structural work shall be made with either high strength bolts (bearing type) or by welding. Proper precaution shall be taken to ensure anchored items will not be distorted or overstressed due to improperly fabricated items.
7. Splice members only where indicated unless, with the Structural Engineer's approval, splices not indicated would result in lower costs due to reduced shipping expense. For splices not indicated, submit structural calculations prepared under direct supervision of and signed by a Professional Engineer licensed in the state where the project is located.
8. Do not use thermal cutting during erection unless approved by the Engineer/Architect in writing.
9. Steel erection shall not proceed without concrete in footings, piers, and walls attaining 75% of the intended minimum compressive design strength. Documentation must be provided indicating compliance with this requirement.

#### B. Surveys:

1. Establish permanent benchmarks necessary for accurate erection of structural steel.
2. Check elevations of concrete surfaces, and locations of anchor bolts and similar items, before erection proceeds.

#### C. Bracing and Protection:

1. Steel shall be well plumbed, leveled and braced to prevent any movement.
  - a. Contractor shall provide and maintain all necessary temporary guying of steel frame to safely resist all wind and construction loads during erection and to assure proper alignment of all parts of the steel frame.
2. Provide all temporary flooring, bracing, shoring and guards necessary to prevent damage or injury. All partially erected steel shall be secured in an approved manner during interruptions of work.

D. Anchor and Foundation Rods:

1. All anchor or foundation rods and similar steel items to be built into concrete or masonry are to be set by the concrete or masonry contractors and shall be furnished promptly so they may be built in as the work progresses because cutting of structural steel members to accommodate errors pertaining to embedded items will not be permitted.

3.3 FIELD WELDING

A. Welding Procedures:

1. All field welding shall be in accordance with AISC Specifications and conform to AWS D1.1 "Structural Welding Code - Steel".
  - a. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
  - b. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice" for Steel Buildings and Bridges" for mill material.
2. Contractor shall remove ceramic ferrules from shear stud connectors in sufficient time to allow for inspection of welds prior to placement of the concrete.

3.4 REPAIRS, PROTECTION, AND TOUCH UP

- A. Repair damaged galvanized coatings and on galvanized items with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.
- B. Touch up Painting: After installation, promptly clean, prepare, and prime or reprime field welds, final connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates and abutting structural steel.
  1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
  2. Apply a compatible primer of the same type as shop primer used on adjacent surfaces.
  3. Secure approval by the Architect prior to field painting.

3.5 GROUTING

- A. Grouting under structural framing members shall be completed after all members have been plumbed and braced and before imposed loads are placed thereon.
- B. Remove all defective concrete, dirt, oil, grease, and other foreign matter from surfaces to which grout will be placed.

3.6 MISCELLANEOUS STEEL AND STEEL LINTELS

- A. Furnish and install all miscellaneous steel as detailed in architectural and structural drawings.
- B. The steel fabricator shall furnish all steel lintels required for masonry wall construction indicated in the architectural and structural drawings and schedules.

- C. Provide additional steel framing for continuous support of steel deck edges at openings and column interruptions.
- D. All exterior exposed steel shall be hot-dip galvanized in accordance with ASTM A123.

END OF SECTION



## SECTION 05 31 00 - STEEL DECK

### PART 1 - GENERAL

#### 1.1 SECTION INCLUDES

- A. Fabrication and erection of steel deck. The Work shall include, but not be limited to the following:
  - 1. Roof deck, roof deck accessories, and roof deck fasteners.
  - 2. Composite floor deck.
  - 3. Shear studs.
- B. Structural notes indicated on the drawings regarding steel decking shall be considered a part of this specification.

#### 1.2 RELATED WORK

- A. Pertinent Sections of Division 01.
- B. Section 03 30 00 - Cast-in-Place Concrete.
- C. Section 05 12 23 - Structural Steel.

#### 1.3 REFERENCES

- A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
  - 1. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.
  - 2. ASCE 9 - Standard for the Structural Design of Composite Slabs and Standard Practice for Construction and Inspection of Composite Slabs.
  - 3. ASTM A36 - Standard Specification for Carbon Structural Steel.
  - 4. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
  - 5. ASTM A653 - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 6. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
  - 7. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
  - 8. AWS D1.1 - Structural Welding Code - Steel.
  - 9. AWS D1.3 - Structural Welding Code - Sheet Steel.
  - 10. SDI Roof Deck Design Manual.
  - 11. SDI Floor Deck Design Manual.
  - 12. SDI Diaphragm Design Manual.

#### 1.4 QUALITY ASSURANCE

- A. Fabricator: Company specializing in performing the work of this section with minimum five (5) years documented experience at manufacturing steel deck. Fabrication Company shall be a current member of the Steel Deck Institute (SDI).

- B. Erector: Company specializing in performing the work of this section with minimum five (5) years documented experience at erecting steel deck.
- C. Welding: Qualify Welding Procedure Specifications (WPS) and welding operator in accordance with AWS D1.3. Provide certifications that welders to be employed in the construction have satisfactorily passed AWS qualifications tests. If recertification of welders is required, retesting will be the contractor's responsibility.

#### 1.5 SUBMITTALS

- A. Prepare and submit shop drawings for Engineer's approval. Shop drawings shall indicate deck layout, depth, uncoated metal thickness, framing and supports with unit dimensions and sections, shear stud layout and complete end jointing. Contractor to verify measurements, lines, elevations, and details of field conditions to conform with actual conditions.
  - 1. Provide details of all accessories.
  - 2. Shop drawings shall also indicate typical welding pattern for steel deck and accessories.
- B. Prepare and submit allowable construction span tables and allowable total load tables for Engineer's approval. Tables shall be accompanied with a letter of certification from the manufacturer stating the tabulated design values were determined in accordance with the Steel Deck Institute's Design Manuals for Roof Deck, Floor Deck and Diaphragm Design.
  - 1. The gauges and section moduli indicated on the drawings or specified herein are minimum and the gauge and section modulus of the deck furnished shall meet or exceed these minimum requirements. All gauges are United States standard, measured prior to coating.
- C. Provide manufacturer's latest recommendations and installation instructions.
- D. Prepare and submit product data of proposed materials.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. All decking materials shall be transported, stored, and erected in a manner that will prevent damage or deformation of sheets. Damaged material shall not be erected or repaired without Structural Engineer's approval.
- B. Deck panels shall be stored clear of the ground, elevated on one end, and protected from weather with waterproof covering.

### PART 2 - PRODUCTS

#### 2.1 STEEL ROOF DECK

- A. Fabricate panels to comply with the "SDI Roof Deck Design Manual," and the following:
  - 1. Steel decking sheet material, minimum yield strength, depth, gauge, profile, and finish are indicated on the drawings, as classified by the Steel Deck Institute (SDI). Panels shall be formed with integral ribs and overlapping side flanges.

## 2.2 COMPOSITE STEEL FLOOR DECK

- A. Composite Steel Floor Deck: Fabricate panels with integrally embossed or raised pattern ribs to comply with the "SDI Floor Deck Design Manual," and the following:
  - 1. Steel decking sheet material, minimum yield strength, depth, gauge, profile, and finish are indicated on the drawings, as classified by the Steel Deck Institute (SDI). Panels shall be formed with integral ribs and overlapping side flanges.

## 2.3 FASTENERS

- A. Support Fasteners:
  - 1. Welded: Refer to the drawings for weld size and spacing requirements.
    - a. Welding rods shall comply with all applicable requirements of the AWS Codes.
    - b. Shear studs may replace support fasteners. Refer to the drawings for requirements.
      - 1) Provide headed stud type of cold finished carbon steel per Section 05 12 23.
      - 2) Use ferrules suitable for use with galvanized steel deck.
    - c. Weld washers are required for material less than 0.028" thick. Weld washers shall be a minimum thickness of 0.0598" and be applicable to AWS D1.3 type welding and of type as recommended by the deck manufacturer.
    - d. Weld metal shall penetrate all layers of deck material and shall have good fusion to the supporting steel. Fasten ribbed deck to steel support members at ends and intermediate supports.
      - 1) All welding shall be in conformance with previously cited AWS recommendations in appearance and quality of welds, and the methods used in correcting welding work.
- B. Side Lap Fasteners:
  - 1. Mechanical: Zinc coated self-drilling, self-tapping type (minimum No. 10) steel screws. Refer to the drawings for fastener spacing requirements.

## 2.4 ACCESSORIES

- A. Steel materials to conform to ASTM A1008 meeting the requirements of ASTM A653, G60 coating.
- B. Provide all closers, fillers, sump pans, pour stops, column closures, girder fillers, and similar accessories required for a complete installation. Provide cover plates at all locations where direction of deck span changes. Unless otherwise noted, accessories shall be of the same steel sheet material, finish, and thickness as the deck sections.
- C. Recessed Sump Pans: Single piece steel sheet of same material, finish, and thickness as the deck, with 3-inch-wide flanges and recessed pan of 1-1/2-inch minimum depth. Cut drain holes in the field.

## **PART 3 - EXECUTION**

### **3.1 ERECTION**

- A. Verify field conditions are acceptable and are ready to receive work. Correct inaccuracies in alignment or level before deck units are finally placed.
- B. Deck units and deck accessories herein specified shall be thoroughly and securely erected by experienced workmen fastening to supporting steel members specified. All work shall be in conformance with the manufacturer's latest printed recommendations and approved shop drawings.
- C. Beginning of installation means installer accepts existing conditions.
- D. The finished work shall be true, flat planes and to slopes indicated with end joints flush and without sharp protruding edges. Exposed underside of deck shall be true without defect.
- E. Where large predetermined openings for elevators, stairs, ducts, and similar elements passing through the deck units occur, furnish prefabricated units to fit job conditions. Where other holes or openings are required in decking after erection, reinforce such holes as indicated on the drawings. Cantilever deck to the edge of slabs only as indicated on the drawings.
- F. Burning of holes in decking will not be permitted.
- G. Steel decking shall be installed to span supporting steel members at right angles. Panels shall be securely anchored to each structural support it rests on or passes.

### **3.2 ROOF DECK**

- A. Fasten roof deck panels to steel supporting members using welds, as specified herein and on the drawings.
- B. Deck shall be fastened through the bottom of the deck rib to all structural supports for the specific deck sections.
- C. End bearing of roof decking shall have a minimum of 1-1/2 inches of bearing occurring over structural supports.
- D. Place deck panels on structural supports and adjust to final position with ends aligned. Attach to supports immediately after placement.
- E. Roof sump pans shall be installed over openings provided in roof deck with flanges welded to the top of the deck. Space welds at 12 inches apart with at least 1 weld in each corner.
- F. Install all roof deck accessories in accordance with the roof deck manufacturer's written instructions.

### **3.3 FLOOR DECK**

- A. Fasten floor deck panels to supporting steel with welds, and shear studs as specified herein and on the drawings.
- B. Unless noted otherwise, secure side laps and perimeter edges of units with fasteners at mid-span between supports or 36 inches on center, whichever distance is smaller.

- C. Place deck panels on structural supports and adjust to final position with ends aligned. Attach to supports immediately after placement.
  - D. Install deck ends over supports with a minimum end bearing of 1-1/2 inches.
  - E. Install pour stops and girder fillers to supporting structure according to manufacturer's recommendations.
  - F. Fasten column closures and cell closures to deck to provide a tight fit. Provide cell closures at changes in direction of deck units, unless otherwise noted.
  - G. Install all floor deck accessories in accordance with the floor deck manufacturer's written instructions.
  - H. If steel stud shear connectors are being applied through the deck onto the structural steel for composite floor construction, the stud welds can be used to replace the specified puddle welds.
  - I. Composite deck sheets with steel shear stud connectors shall be butted over supporting members. Standard tolerance for ordered lengths is plus or minus 1/2 inch.
  - J. Steel studs connectors shall be installed only by certified operators who are thoroughly familiar with the installation equipment.
  - K. Steel stud connectors shall have complete fusion to the steel beams underlying the decking. Where repairs are made by fillet welding, such welding shall be between stud and beam, with removal of portions of the decking as required.
  - L. Where the decking is thick due to heavy gauge sheets or double sheets at cellular panels, holes in one or more sheets shall be made before stud welding when required to ensure fusion of steel stud connectors to beams. When such holes are not made, fusion shall be verified.
  - M. Ferrules shall be removed after completion.
- 3.4 FIELD TOUCH UP
- A. After erection, all weld burn marks and abraded spots shall be cleaned and field painted with a rust-inhibiting metal primer matching formulations and color of shop coat or a zinc-rich rust inhibiting paint for galvanized deck surfaces.

END OF SECTION

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## **SECTION 05 40 00 - COLD-FORMED STEEL FRAMING (CFSF) SYSTEM**

### **PART 1 - GENERAL**

#### **1.1 SECTION INCLUDES**

- A. Load bearing structural steel stud, framing system of 18 to 12-gauge (43 mil to 97 mil) members along with fasteners and related accessories. Furnish and install cold-form steel framing, as shown on the drawings and specified herein. Work shall include, but not be limited to the following items:
  - 1. Non-load bearing formed steel stud exterior wall framing.
  - 2. Provide tracks, blocking, lintels, clips angles, bridging, shoes, reinforcements, fasteners, and accessories to construct a complete steel framing system.
- B. Structural notes indicated on the drawings regarding cold-formed steel framing system shall be considered a part of this Specification.

#### **1.2 RELATED WORK**

- A. Pertinent Sections of Division 01.
- B. Section 01 23 00 - Alternates.
- C. Section 05 12 23 - Structural Steel.
- D. Section 05 31 00 - Steel Deck.
- E. Division 9 for non-load bearing studs of 20 gauge (33 mil) or lighter.

#### **1.3 REFERENCES**

- A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
  - 1. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.
  - 2. AISI S200 - North American Standard for Cold-Formed Steel Framing - General Provisions.
  - 3. AISI S202 - North American Standard for Cold-Formed Steel Structural Framing.
  - 4. AISI S211 - North American Standard for Cold-Formed Steel Framing - Wall Stud Design.
  - 5. AISI S212 - North American Standard for Cold-Formed Steel Framing - Header Design.
  - 6. AISI S213 - North American Standard for Cold-Formed Steel Framing - Lateral Design.
  - 7. ASTM A653 - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 8. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
  - 9. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members.
  - 10. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
  - 11. AWCI - Association of Wall and Ceiling Industries.
  - 12. AWS D1.3 - Structural Welding Code - Sheet Steel.

13. SSMA - Steel Stud Manufacturers Association.

#### 1.4 QUALITY ASSURANCE

##### A. Workmen Qualifications:

1. For the actual erection of cold-formed steel framing system, use only skilled journeymen steel framing erectors who are thoroughly experienced with the materials and methods specified.
2. Use qualified welders and comply with AWS standards.

B. Manufacturer: Company specializing in performing the work of this section with a minimum of five (5) years documented experience at manufacturing cold-formed steel and framing systems and related accessories. Manufacturer shall be a current and "full" member of the Steel Stud Manufacturers Association (SSMA) or Steel Framing Industry Association (SFIA).

C. All cold-formed steel furnished under this section shall be supplied by a manufacturer who is a current member of the Steel Stud Manufacturers Association (SSMA) or Steel Framing Industry Association (SFIA).

D. Steel studs, headers, and other elements used for this project are sized based on SSMA. Elements of equal or greater capacity may be exchanged.

#### 1.5 SYSTEM PERFORMANCE REQUIREMENTS

##### A. Structural Performance:

1. Provide cold-formed steel framing (CFSF) capable of withstanding design loads indicated on the plans.
2. Design CFSF to withstand design loads meeting the following deflection limits:
  - a. Exterior walls backing up brick or stone veneer: Horizontal deflection of 1/600 of wall height.
  - b. Exterior walls clad with metal siding, exterior insulated finish systems or other flexible non-brittle finishes: Horizontal deflection of 1/240 of wall height.
3. Design CFSF to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120°F.
4. Design system to accommodate construction tolerances, deflection of building structural members (1-inch maximum), and clearances of intended openings.
5. CFSF shall be designed in accordance with all AISI Standards.

#### 1.6 SUBMITTALS

##### A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer's approval, including framing plans indicating size, gauge, weight, and location of all framing members. Shop drawings shall indicate the following:
  - a. Component details, framed openings, bearing, anchorage, loading, welds, type and location of fasteners, bracing, bridging, strapping, connections, and accessories or items required of other related work. Provide stud, layout.



- b. Describe method for securing studs to tracks and for bolted/welded framing connections.
- c. Provide calculations for loadings and stresses of the steel framing system, including specially fabricated components, prepared by a registered Professional Engineer, with registration from the State in which the project is located.
- d. Detail size and location of all bridging, strapping, bracing, splices, and accessories required for installation.

B. Product Data:

- 1. Provide product data on standard framing members. Describe materials and finish, product criteria and limitations. Submit manufacturer's installation instructions.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Steel members shall be transported, stored, and erected in a manner that will avoid any damage or deformation. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of ground and in such a manner so as to eliminate excessive handling.

**PART 2 - PRODUCTS**

2.1 MATERIALS

A. Framing Materials:

- 1. Studs shall conform to the ASTM designations listed in the General Notes of the drawings, unless noted otherwise, and be formed to channel shape, punched web, with nominal size as indicated on the drawings.
- 2. Track shall be minimum 18 gauge (43 mil) thick sheet steel, channel shaped, solid web, same width as studs. Track shall provide a tight fit for studs.

B. Accessories:

- 1. Bracing, furring, and bridging shall consist of formed sheet steel with thickness determined for conditions encountered. Provide manufacturer's standard shapes, complete with finish same as framing members.
- 2. Plates, gussets, and clips shall consist of formed sheet steel with thickness determined for conditions encountered. Provide manufacturer's standard shapes, complete with finish same as framing members.

C. Fasteners:

- 1. Self-drilling, self-tapping screws, bolts, nuts, and washers shall conform to ASTM A90, complete with hot-dip galvanized coating, minimum size: 1/4-14.
- 2. Expansion anchors shall be "Kwik" bolts, as manufactured by Hilti, Inc.
- 3. All other fasteners shall be as indicated on drawings or as recommended by the cold-form manufacturer.

D. Finishes:

- 1. Furnish all studs, and system components with a factory galvanized (G60), finish.

## 2.2 FABRICATION

- A. Fabricate assemblies of framed sections, of sizes and profiles required with framing members fitted, reinforced, and braced to suit design requirements.
- B. Fit and assemble in largest practical sections for delivery to Worksite, ready for installation.
- C. Bearing studs must be fabricated with full stud end seated against track web. Do not use studs that have been cut at punchouts.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Verify substrate surfaces and building framing components are ready to receive work.
- B. Beginning of installation means acceptance of existing conditions and substrate.

### 3.2 INSTALLATION

- A. General:
  - 1. Cold-formed steel framing system shall consist of structural steel studs with locations as shown on the drawings. All work shall be in accordance with approved shop drawings and manufacturer's latest printed specifications. Framing members shall be securely attached by mechanical fasteners as indicated on the drawings and as recommended by the manufacturer.
    - a. Wire tying of stud components will not be allowed.
    - b. Complete framing system ready to receive subsequent facing material.
  - 2. Provision shall be made in the studs for rigid fastening of all blocking and special braces or framing and for attachment and support of electrical outlets or other equipment indicated to be supported by stud construction.
    - a. All anchorage, bracing and blocking shall be in accordance with approved shop drawings and as recommended by the manufacturer.
  - 3. Surfaces abraded by handling, weld locations and other miscellaneous defects shall be touched-up with zinc-rich galvanizing compound (ZRC) coating.
- B. Erection of Studding:
  - 1. Top and bottom track members shall be the same size and gauge as the stud and be continuous for the total length of the framing system or as long as practical and shall be securely attached a maximum of 24 inches on center with approved fastening devices. Studs shall extend in one piece full height vertically between tracks, spaced no greater than 24 inches on center, with all web cut-outs in perfect alignment. Studs shall provide solid backing at corners and jambs. Install studs with all components properly aligned and braced with all work plumb and true, ready and acceptable to receive surface materials.
    - a. Coordinate installation of sealant with floor and ceiling tracks.
    - b. Field cutting of studs shall be done by sawing.

- c. Splices in axially loaded studs will not be permitted.
  - d. Erect load bearing studs, brace and reinforce to develop full strength to meet design requirements.
  - e. Extend stud framing through ceiling to underside of floor or roof structure above.
  - f. Install intermediate studs above and below openings with studs equally spaced to correspond to adjacent stud spacing.
  - g. Provide deflection allowance in stud track, directly below horizontal building framing for non-load bearing framing.
  - h. Framing fabricator shall ensure punchout alignment when assembling framing and field cutting to length.
  - i. All framing components shall be cut squarely for attachment to perpendicular members.
  - j. In the event a track butt joint occurs within a panel, abutting pieces of track shall be butt welded or spliced together. No such splices shall occur at any head or sill condition.
2. Steel studs shall be located not more than 2 inches from all door, abutting partitions, partition corners and other construction. Unless detailed otherwise, track or stud member shall be used as a runner over door frames. Structural studs shall be securely and rigidly anchored in place to give total and complete support to subsequent materials attached thereto. All studs shall be securely attached to jamb and head anchor clips of each door frame by manufacturer's recommended method.
- a. Construct corners using minimum three studs. Jamb studs at doors, windows, and other wall openings shall be designed to resist the tributary load of the opening and meet specified performance requirements.
  - b. Cold-rolled steel channel stiffeners or bridging shall be provided and installed horizontally every 60 inches in all framing systems through stud web cut-outs with clips welded in place at each stud.

END OF SECTION

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## SECTION 05 50 00 - METAL FABRICATIONS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Steel framing and supports for operable partitions.
  - 2. Steel framing and supports for overhead grilles.
  - 3. Steel framing and supports for countertops.
  - 4. Steel tube reinforcement for low partitions.
  - 5. Steel framing and supports for mechanical and electrical equipment.
  - 6. Steel framing and supports for applications where framing and supports are not specified in other Sections.
  - 7. Shelf angles.
  - 8. Miscellaneous aluminum angles and trim.
  - 9. Safety and tie-back anchors.
  - 10. Miscellaneous steel trim including steel edgings .
  - 11. Loose bearing and leveling plates for applications where they are not specified in other Sections.
- B. Products furnished, but not installed, under this Section include the following:
  - 1. Loose steel lintels.
  - 2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
  - 3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.
- C. Related Requirements:
  - 1. Section 04 20 00 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
  - 2. Section 05 12 00 "Structural Steel Framing" for steel framing, supports, elevator machine beams, hoist beams, divider beams, door frames, and other steel items attached to the structural-steel framing.

#### 1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Fasteners.
  - 2. Shrinkage-resisting grout.

- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
1. Steel framing and supports for operable partitions.
  2. Steel tube reinforcement for low partitions.
  3. Steel framing and supports for mechanical and electrical equipment.
  4. Steel framing and supports for applications where framing and supports are not specified in other Sections.
  5. Shelf angles.
  6. Miscellaneous steel trim.
  7. Loose steel lintels.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

#### 1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  2. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

#### 1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

### **PART 2 - PRODUCTS**

#### 2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 304.
- D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 304.
- E. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- F. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- G. Cast Iron: Either gray iron, ASTM A48/A48M, or malleable iron, ASTM A47/A47M, unless otherwise indicated.
- H. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
- I. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.

#### 2.2 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless steel fasteners for fastening stainless steel.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1.
- E. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
  1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- G. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.
- H. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
  1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

## 2.3 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."
- B. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- E. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

## 2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.

- E. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

## 2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
  - 1. Fabricate units from slotted channel framing where indicated.
  - 2. Furnish inserts for units installed after concrete is placed.
- C. Fabricate supports for operable partitions from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.
- D. Galvanize miscellaneous framing and supports where exposed to weather.
- E. Prime miscellaneous framing and supports.

## 2.6 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
  - 1. Provide mitered and welded units at corners.
  - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize and prime shelf angles located in exterior walls.



## 2.7 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
  - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Prime exterior miscellaneous steel trim.

## 2.8 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize bearing and leveling plates.
- C. Prime plates with zinc-rich primer.

## 2.9 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches unless otherwise indicated.
- C. Galvanize and prime loose steel lintels located in exterior walls.

## 2.10 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

## 2.11 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

## 2.12 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
  - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

1. Shop prime with primers specified in Section 09 91 13 "Exterior Painting" and primers specified in Section 09 91 23 "Interior Painting" unless zinc-rich primer is indicated.
  - D. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
  - E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
- 2.13 ALUMINUM FINISHES
- A. As-Fabricated Finish: AA-M12.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION, GENERAL**

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with bituminous paint.

#### **3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS**

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for operable partitions securely to, and rigidly brace from, building structure.
- C. Anchor shelf angles securely to existing construction with anchor bolts.

#### **3.3 INSTALLATION OF BEARING AND LEVELING PLATES**

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

#### 3.4 REPAIRS

- A. Touchup Painting:
  - 1. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 13 "Exterior Painting" and Section 09 91 23 "Interior Painting."
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

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## **SECTION 05 51 13 - METAL PAN STAIRS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

**A. Section Includes:**

1. Steel stairs with concrete-filled treads.
2. Steel tube railings and guards attached to metal stairs.
3. Steel tube handrails attached to walls adjacent to metal stairs.
4. Railing gates at the level of exit discharge.

#### **1.2 COORDINATION**

- A.** Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B.** Coordinate installation of anchorages for metal stairs, railings, and guards.
1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
  2. Deliver such items to Project site in time for installation.
- C.** Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.
- D.** Schedule installation of railings and guards so wall attachments are made only to completed walls.
1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

#### **1.3 ACTION SUBMITTALS**

- A.** Product Data: For metal pan stairs and the following:
1. Abrasive nosings.
  2. Shop primer products.
  3. Handrail wall brackets.
  4. Grout.
- B.** Shop Drawings:
1. Include plans, elevations, sections, details, and attachments to other work.
  2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
  3. Include plan at each level.
  4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.
- C.** Delegated Design Submittal: For stairs, railings and guards,, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A.** Qualification Data: For professional engineer's experience with providing delegated design engineering services of the kind indicated, including documentation that engineer is licensed in the State in which Project is located.

- B. Welding certificates.
- 1.5 QUALITY ASSURANCE
- A. Installer Qualifications: Fabricator of products.
  - B. Welding Qualifications: Qualify procedures and personnel according to the following:
    - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
    - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Store materials to permit easy access for inspection and identification.
    - 1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
    - 2. Protect steel members and packaged materials from corrosion and deterioration.
    - 3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
      - a. Repair or replace damaged materials or structures as directed.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design stairs, railings and guards,, including attachment to building construction.
- B. Structural Performance of Stairs: Metal stairs withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Uniform Load: 100 lbf/sq. ft..
  - 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
  - 3. Uniform and concentrated loads need not be assumed to act concurrently.
  - 4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.
  - 5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.
- C. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ft. applied in any direction.
    - b. Concentrated load of 200 lbf applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
  - 2. Infill of Guards:
    - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
    - b. Infill load and other loads need not be assumed to act concurrently.

### **2.2 METALS**

- A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

- C. Steel Tubing for Railings and Guards: ASTM A500/A500M (cold formed) or ASTM A513/A513M.
- D. Steel Pipe for Railings and Guards: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight, unless another grade and weight are required by structural loads.
- E. Uncoated, Cold-Rolled Steel Sheet: ASTM A1008/A1008M, either commercial steel, Type B, or structural steel, Grade 25, unless another grade is required by design loads; exposed.
- F. Uncoated, Hot-Rolled Steel Sheet: ASTM A1011/A1011M, either commercial steel, Type B, or structural steel, Grade 30, unless another grade is required by design loads.
- G. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.

## 2.3 ABRASIVE NOSINGS

- A. Extruded Units: Aluminum units with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit openings or conditions.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Safety Tread Co., Inc.
    - b. Amstep Products.
    - c. Balco; a CSW Industrials Company.
    - d. Nystrom.
    - e. Wooster Products Inc.
  - 2. Provide ribbed units, with abrasive filler strips projecting 1/16 inch above aluminum extrusion.
  - 3. Nosings, Square-Back Units: 1-7/8 inches wide, without lip.
- B. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.
- C. Apply clear lacquer to concealed surfaces of extruded units set into concrete.

## 2.4 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls.
  - 1. Select fasteners for type, grade, and class required.
- B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.
- C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
- E. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

## 2.5 MISCELLANEOUS MATERIALS

- A. Handrail Wall Brackets: Cast stainless steel, center of rail 2-1/2 inches from face of wall.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Blum, Julius & Co., Inc.
    - b. The Wagner Companies.
- B. Welding Electrodes: Comply with AWS requirements.
- C. Shop Primers: Provide primers that comply with Section 09 91 23 "Interior Painting."
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- E. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

## 2.6 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings and guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
  - 1. Join components by welding unless otherwise indicated.
  - 2. Use connections that maintain structural value of joined pieces.
- B. Assemble stairs, railings, and guards in shop to greatest extent possible.
  - 1. Disassemble units only as necessary for shipping and handling limitations.
  - 2. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately.
  - 1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
  - 2. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Weld exposed corners and seams continuously unless otherwise indicated.
  - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish # 3 - Partially dressed weld with spatter removed.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
  - 1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
  - 2. Locate joints where least conspicuous.
  - 3. Provide weep holes where water may accumulate internally.



## 2.7 FABRICATION OF STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Commercial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
  - 1. Stringers: Fabricate of steel rectangular tubes.
    - a. Stringer Size: As required to comply with "Performance Requirements" Article, but not less than as indicated on Drawings.
    - b. Provide closures for exposed ends of channel and rectangular tube stringers.
    - c. Finish: Shop primed.
  - 2. Platforms: Construct of steel channel or steel rectangular tube headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.
    - a. Provide closures for exposed ends of channel and rectangular tube framing.
    - b. Finish: Shop primed.
  - 3. Weld or bolt stringers to headers; weld framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
  - 4. Where stairs are enclosed by gypsum board assemblies, provide hanger rods or struts to support landings from floor construction above or below.
    - a. Locate hanger rods and struts where they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.
- C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch.
  - 1. Steel Sheet, Uncoated: Cold or Hot-rolled steel sheet.
  - 2. Directly weld metal pans to stringers; locate welds on top of subtreads where they will be concealed by concrete fill. Do not weld risers to stringers.
  - 3. Shape metal pans to include nosing integral with riser.
  - 4. Attach abrasive nosings to risers where indicated.
  - 5. At Contractor's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.
  - 6. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.

## 2.8 FABRICATION OF STAIR RAILINGS AND GUARDS

- A. |Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.
  - 1. Rails, Posts and Guard Infill: As indicated in Drawings
  - 2. Gates: Form gates from steel tube of same size and shape as top rails, with infill to match guards. Provide with cam-type, self-closing hinges for fastening to wall and overlapping stop with rubber bumper to prevent gate from opening in direction opposite egress.
- B. Welded Connections: Fabricate railings and guards with welded connections.
  - 1. Fabricate connections that are exposed to weather in a manner that excludes water.
    - a. Provide weep holes where water may accumulate internally.
  - 2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
  - 3. Weld all around at connections, including at fittings.
  - 4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

5. Obtain fusion without undercut or overlap.
  6. Remove flux immediately.
  7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #3 - Partially dressed weld with spatter removed as shown in NAAMM AMP 521.
- C. Form changes in direction of railings and guards as follows:
    1. As detailed.
  - D. Close exposed ends of railing and guard members with prefabricated end fittings.
  - E. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
    1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
  - F. Connect posts to stair framing by direct welding unless otherwise indicated.
  - G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
    1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
    2. For nongalvanized railings and guards, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
    3. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.
  - H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.
    1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.
- 2.9 FINISHES
- A. Finish metal stairs after assembly.
  - B. Preparation for Shop Priming: Prepare uncoated, ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
  - C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.
  1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION OF METAL PAN STAIRS**

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.

1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
  1. Grouted Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates.
    - a. Clean bottom surface of plates.
    - b. Set plates for structural members on wedges, shims, or setting nuts.
    - c. Tighten anchor bolts after supported members have been positioned and plumbed.
    - d. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
    - e. Promptly pack grout solidly between bearing surfaces and plates so no voids remain.
      - 1) Neatly finish exposed surfaces; protect grout and allow to cure.
      - 2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- D. Fit exposed connections accurately together to form hairline joints.
  1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
  2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
  3. Comply with requirements for welding in "Fabrication, General" Article.
- E. Place and finish concrete fill for treads and platforms to comply with Section 03 30 00 "Cast-in-Place Concrete."
  1. Install abrasive nosings with anchors fully embedded in concrete where indicated.
  2. Center nosings on tread width.

### 3.3 INSTALLATION OF RAILINGS AND GUARDS

- A. Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.
  1. Space posts at spacing indicated or, if not indicated, as required by design loads.
  2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet.
  3. Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet.
  4. Secure posts, rail ends, and guard ends to building construction as follows:
    - a. Anchor posts to steel by welding to steel supporting members.
    - b. Anchor handrail and guard ends to concrete and masonry with steel round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.
- B. Install railing gates level, plumb, and secure for full opening without interference.
  1. Attach hardware using tamper-resistant or concealed means.
  2. Adjust hardware for smooth operation.
- C. Attach handrails to wall with wall brackets.
  1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
  2. Secure wall brackets to building construction as follows:

- a. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
- b. For hollow masonry anchorage, use toggle bolts.
- c. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.

#### 3.4 REPAIR

##### A. Touchup Painting:

- 1. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 23 "Interior Painting."

END OF SECTION

## SECTION 05 51 19 - METAL GRATING STAIRS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Industrial Class stairs with steel-grating treads.
  - 2. Steel railings and guards attached to metal stairs.
  - 3. Interior steel handrails and guards associated with metal grating stairs, bar grating platforms, and exterior guard and rail assemblies.
- B. Related Requirements:
  - 1. Section 01 23 00 "Alternates" for alternates affecting this section.
  - 2. Section 05 50 00 "Metal Fabrications."
  - 3. Section 05 53 13 "Bar Gratings."

#### 1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs, railings, and guards.
  - 1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
  - 2. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.
- D. Schedule installation of railings and guards so wall attachments are made only to completed walls.
  - 1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For metal grating stairs and the following:
  - 1. Gratings.
  - 2. Grout.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, details, and attachment to other work.
  - 2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
  - 3. Include plan at each level.
  - 4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

- C. Delegated-Design Submittal: For stairs, railings, and guards, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the State in which Project is located.
  - B. Welding certificates.
- 1.6 QUALITY ASSURANCE
- A. Installer Qualifications: Fabricator of products.
  - B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Store materials to permit easy access for inspection and identification.
    - 1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
    - 2. Protect steel members and packaged materials from corrosion and deterioration.
    - 3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
      - a. Repair or replace damaged materials or structures as directed.

## **PART 2 - PRODUCTS**

- 2.1 PERFORMANCE REQUIREMENTS
- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design stairs, railings, and guards, including attachment to building construction.
  - B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
    - 1. Uniform Load: 100 lbf/sq. ft..
    - 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
    - 3. Uniform and concentrated loads need not be assumed to act concurrently.
    - 4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.
    - 5. Limit deflection of treads, platforms, and framing members to  $L/360$ .
  - C. Structural Performance of Railings and Guards: Rails and guards shall comply with the requirements in Section 05 51 13 "Metal Pan Stairs."
- 2.2 METALS
- A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
  - B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
  - C. Steel Bars for Grating Treads: ASTM A36/A36M or steel strip, ASTM A1011/A1011M or ASTM A1018/A1018M.

- D. Steel Wire Rod for Grating Crossbars: ASTM A510/A510M.
- E. Cast-Abrasive Nosings: Cast iron, with an integral abrasive, as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both.

## 2.3 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 .
  - 1. Select fasteners for type, grade, and class required.
- B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.
- C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
  - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts.
- E. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.
  - 1. Alloy Group 1 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

## 2.4 MISCELLANEOUS MATERIALS

- A. Welding Electrodes: Comply with AWS requirements.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for exterior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

## 2.5 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, railings, guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
  - 1. Join components by welding unless otherwise indicated.
  - 2. Use connections that maintain structural value of joined pieces.
- B. Assemble stairs, railings, and guards in shop to greatest extent possible.
  - 1. Disassemble units only as necessary for shipping and handling limitations.
  - 2. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately.
  - 1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
  - 2. Remove sharp or rough areas on exposed surfaces.

- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Weld exposed corners and seams continuously unless otherwise indicated.
  - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish # 4 - Good quality, uniform undressed weld with minimal splatter.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
  - 1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
  - 2. Locate joints where least conspicuous.
  - 3. Fabricate joints that are exposed to weather in a manner to exclude water.
  - 4. Provide weep holes where water may accumulate internally.

## 2.6 FABRICATION OF STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Industrial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
  - 1. Fabricate stringers of steel channels.
    - a. Stringer Size: As required to comply with "Performance Requirements" Article.
    - b. Provide closures for exposed ends of channel stringers.
    - c. Finish: Galvanized.
  - 2. Construct platforms and tread supports of steel channel headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.
    - a. Provide closures for exposed ends of channel framing.
    - b. Finish: Galvanized.
  - 3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers.
  - 4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.
- C. Metal Bar-Grating Stairs: Form treads and platforms to configurations shown from metal bar grating; fabricate to comply with NAAMM MBG 531, "Metal Bar Grating Manual."
  - 1. Fabricate treads and platforms from welded steel or pressure-locked steel grating with openings in gratings no more than 1/2 inch in least dimension.
    - a. Surface: Plain.
    - b. Finish: Galvanized.
  - 2. Fabricate grating treads with cast-abrasive nosing and with steel angle or steel plate carrier at each end for stringer connections.
    - a. Secure treads to stringers with bolts.
  - 3. Fabricate grating platforms with nosing matching that on grating treads.
    - a. Secure grating to platform framing with bolts.



- D. Risers: Solid.
- E. Toe Plates: Provide toe plates around openings and at edge of open-sided floors and platforms, and at open ends and open back edges of treads.
  - 1. Material and Finish: Steel plate to match finish of other steel items.
  - 2. Fabricate to dimensions and details indicated.

## 2.7 FABRICATION OF STAIR RAILINGS AND GUARDS

- A. Fabricate railings and guards to comply with requirements indicated in Section 05 51 13 "Metal Pan Stairs" except as indicated otherwise.
- B. Welded Connections: Fabricate railings and guards with welded connections.
  - 1. Fabricate connections that are exposed to weather in a manner that excludes water.
    - a. Provide weep holes where water may accumulate internally.
  - 2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
  - 3. Weld all around at connections, including at fittings.
  - 4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 5. Obtain fusion without undercut or overlap.
  - 6. Remove flux immediately.
  - 7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish # 4 - Good quality, uniform undressed weld with minimal splatter as shown in NAAMM AMP 521.
- C. Form changes in direction of railings and guards as detailed.
- D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required.
  - 1. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing and guard members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
  - 1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- G. Connect posts to stair framing by direct welding unless otherwise indicated.
- H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
  - 1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
  - 2. For galvanized railings and guards, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.

## 2.8 FINISHES

- A. Finish metal stairs after assembly.
- B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
  - 1. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.
  - 1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION OF METAL STAIRS**

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
  - 1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
  - 1. Grouted Baseplates: Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces.
    - a. Clean bottom surface of baseplates.
    - b. Set steel-stair baseplates on wedges, shims, or leveling nuts.
    - c. After stairs have been positioned and aligned, tighten anchor bolts.
    - d. Do not remove wedges or shims, but if protruding, cut off flush with edge of bearing plate before packing with grout.
    - e. Promptly pack grout solidly between bearing surfaces and plates to ensure that no voids remain.
      - 1) Neatly finish exposed surfaces; protect grout and allow to cure.
      - 2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints.
  - 1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
  - 2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
  - 3. Comply with requirements for welding in "Fabrication, General" Article.
- F. Install railings and guards as indicated in Section 05 51 13.

### **3.3 REPAIR**

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

## **SECTION 05 58 16 - FORMED METAL ENCLOSURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes: Interior formed metal enclosure soffit system for concealment of fire suppression and other mechanical systems.
- B. Related Requirements:
  - 1. Section 01 22 00 "Unit Prices."
  - 2. Section 01 23 00 "Allowances."
  - 3. Section 07 92 16.13 "Rigid Security Joint Sealants"
  - 4. Division 21: Fire Suppression
  - 5. Division 22: Plumbing
  - 6. Division 23: Heating, Ventilating, and Air-Conditioning
  - 7. Division 26: Electrical

#### **1.3 COORDINATION**

- A. Coordinate installation of formed metal enclosures that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

#### **1.4 SUBMITTALS**

- A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of formed metal enclosures and their connections. Show anchorage and accessory items.

#### **1.5 MAINTENANCE MATERIALS**

- A. Furnish to Owner quantity of spare parts equal to minimum 5 percent of the total quantities of each soffit enclosure system component installed for future use and that are packaged with protective covering for storage and identified with labels describing contents. This material shall not be used to replace units damaged in the course of construction on the Project.

### **PART 2 - PRODUCTS**

#### **2.1 SOFFIT ENCLOSURE SYSTEM**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide JG Innovations; Soffi-Steel System or an equivalent product by, but not limited to the following:
  - 1. In-Ex Systems, Inc.

#### **2.2 DESCRIPTION**

- A. Factory fabricated steel soffit enclosure cover support system in configurations and dimensions indicated on the Drawings for concealment of fire suppression and other mechanical systems.
- B. System shall incorporate a concealed snap-lock connection that once assembled, renders the cover essentially irremovable with the use of ordinary tools.

## 2.3 MATERIALS

- A. Support/Attachment Devices: Spring steel shield clips in sizes recommended by manufacturer for securement of the cover. Fabricate clips from minimum 21-gauge zinc-plated spring steel with a reverse curvature design to firmly secure the soffit enclosure, preventing easy removal. Clips shall be capable of resisting a force of 200 lbs. uplift at free ends. Provide test results upon request by A/E.
- B. Soffit Enclosure Cover:
  - 1. Minimum 16-gauge A60/G90 galvanized steel fabricated for snap-lock interfacing with the clips, preventing easy removal when assembled.
  - 2. Provide cover with interlocking integral joints to allow for securement using stainless steel rivets. Space rivets not more than 2-inches o.c. along joint and position not more than 1-inch from end of overlapping section. External couplings not permitted.
  - 3. Provide cover with roll-formed groove at interface of cover and adjacent construction surface to allow application of sealants and adhesives.

## 2.4 ACCESSORIES

- A. Provide tamper-resistant end caps, prefabricated corners, wall flanges, couplings, and other items required for a complete system.
- B. Security Sealants: Provided by Section 07 92 16.13 contractor.

## 2.5 FINISHES

- A. All exposed surfaces of formed metal enclosures and related fittings shall be factory primed and painted with manufacturer's recommended primer and epoxy paint finish.
- B. Colors: As selected by A/E from manufacturer's full range.

## PART 3 - EXECUTION

- A. INSTALLATION
- B. Install soffit enclosure system over all exposed piping, ductwork, electrical, or other MEPF items within the secure perimeter, in areas exposed to inmates.
- C. Install soffit enclosure system in accordance with approved shop drawings and manufacturer's printed instructions.
- D. Select appropriate fasteners for the substrate encountered to adequately secure the soffit enclosure system.
- E. Anchor support devices squarely and firmly against the substrate surfaces in a straight line.
- F. Field cut penetration to prevent misalignment with intended protrusion.
- G. Access Doors: Factory furnished and installed where indicated.
- H. Touch-up (spray or brush) field cut edges and scratches with a matching paint.
- I. Seal all soffit edges with rigid security sealant.

End of Section 05 58 16

## **SECTION 05 73 00 - DECORATIVE METAL RAILINGS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Stainless steel decorative railings.
- B. Related Requirements:
  - 1. Section 06 10 00 "Rough Carpentry" for wood blocking for anchoring railings.
  - 2. Section 06 20 23 "Interior Finish Carpentry" for wood railings.

#### **1.2 COORDINATION AND SCHEDULING**

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver items to Project site in time for installation.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Nonshrink, nonmetallic grout.
- B. Shop Drawings: Include plans, elevations, sections, and attachment details.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.

#### **1.6 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

#### **1.8 FIELD CONDITIONS**

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design railings, including attachment to building construction.

- B. Structural Performance: Railings, including attachment to building construction, are to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
    - 1. Handrails and Top Rails of Guards:
      - a. Uniform load of 50 lbf/ft. applied in any direction.
      - b. Concentrated load of 200 lbf applied in any direction.
      - c. Uniform and concentrated loads need not be assumed to act concurrently.
  - C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior railings by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
    - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- 2.2 METALS, GENERAL
- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
  - B. Brackets, and Anchors: Same metal and finish as supported rails unless otherwise indicated.
- 2.3 STAINLESS STEEL DECORATIVE RAILINGS
- A. Products: Custom-fabricated stainless steel bar stock railings.
  - B. Source Limitations: Obtain stainless steel decorative railing components from single source from single manufacturer.
  - C. Bars and Shapes: ASTM A276/A276M, Type 304.
- 2.4 MISCELLANEOUS MATERIALS
- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
    - 1. For stainless steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
  - B. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- 2.5 FABRICATION
- A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
  - B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
    - 1. Clearly mark units for reassembly and coordinated installation.
    - 2. Use connections that maintain structural value of joined pieces.
  - C. Cut, drill, and punch metals cleanly and accurately.
    - 1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
    - 2. Remove sharp or rough areas on exposed surfaces.
  - D. Form work true to line and level with accurate angles and surfaces.

- E. Connections: Fabricate railings with welded connections unless otherwise indicated.
- F. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove flux immediately.
  - 4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.
- G. Brackets, Fittings, and Anchors: Provide wall brackets, handrail brackets, miscellaneous fittings, and anchors to interconnect railing members to other Work unless otherwise indicated.
  - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and to prevent bracket or fitting rotation and crushing of substrate.
- H. Provide inserts and other anchorage devices for connecting railings to concrete or masonry Work.
  - 1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
  - 2. Coordinate anchorage devices with supporting structure.
- I. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

## 2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

## 2.7 STAINLESS STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Stainless Steel Sheet and Plate Finishes:
  - 1. Directional Satin Finish: ASTM A480/A480M, No. 4.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

### 3.2 INSTALLATION, GENERAL

- A. Perform cutting, drilling, and fitting required for installing railings.
  - 1. Fit exposed connections together to form tight, hairline joints.
  - 2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
  - 3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
  - 4. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
  - 5. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

### 3.3 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.

### 3.4 ANCHORING POSTS

- A. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Leave anchorage joint exposed with anchoring material flush with adjacent surface.

### 3.5 ATTACHING RAILINGS

- A. Attach handrails to walls with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.
  - 1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

### 3.6 CLEANING

- A. Clean stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

### 3.7 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION



**DIVISION 06**



## **SECTION 06 10 00 - ROUGH CARPENTRY**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Wood products.
  - 2. Fire-retardant-treated lumber.
  - 3. Dimension lumber framing.
  - 4. Miscellaneous lumber.
  - 5. Plywood backing panels.
- B. Related Requirements:
  - 1. Section 06 16 00 "Sheathing" for sheathing.

#### **1.2 DEFINITIONS**

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. Lumber grading agencies, and abbreviations used to reference them, include the following:
  - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
  - 2. NLGA: National Lumber Grades Authority.
  - 3. SPIB: The Southern Pine Inspection Bureau.
  - 4. WCLIB: West Coast Lumber Inspection Bureau.
  - 5. WWPA: Western Wood Products Association.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
  - 2. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5664.
  - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- B. Sustainable Design Submittals:
  - 1. Chain-of-Custody Qualification Data: For manufacturer and vendor.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

## **PART 2 - PRODUCTS**

### **2.1 WOOD PRODUCTS**

- A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
  - 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content:
  - 1. Boards: 19 percent.
  - 2. Dimension Lumber: 19 percent unless otherwise indicated.

### **2.2 FIRE-RETARDANT-TREATED LUMBER**

- A. General: Where fire-retardant-treated materials are indicated, materials are to comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
  - 1. Treatment is not to promote corrosion of metal fasteners.
  - 2. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency and other information required by authorities having jurisdiction.
- E. Application: Treat items indicated on Drawings, and the following:
  - 1. Framing for raised platforms.
  - 2. Framing for stages.
  - 3. Plywood backing panels.

### **2.3 DIMENSION LUMBER FRAMING**

- A. Non-Load-Bearing Interior Partitions by Grade: Construction or No. 2 grade.
  - 1. Species:
    - a. Spruce-pine-fir; NLGA.
- B. Joists, Rafters, and Other Framing by Grade: Construction or No. 2 grade.
  - 1. Species:
    - a. Spruce-pine-fir; NLGA.

## 2.4 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
  - 1. Blocking.
  - 2. Nailers.
  - 3. Cants.
  - 4. Furring.
  - 5. Grounds.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of the following species:
  - 1. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades, or better:
  - 1. Mixed southern pine or southern pine; No. 3 grade; SPIB.
  - 2. Hem-fir or hem-fir (north); Standard or No. 3 Common grade; NLGA, WCLIB, or WWPA.
  - 3. Spruce-pine-fir (south) or spruce-pine-fir; Standard or No. 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA.
  - 4. Eastern softwoods; No. 3 Common grade; NeLMA.
  - 5. Northern species; No. 3 Common grade; NLGA.
  - 6. Western woods; Standard or No. 3 Common grade; WCLIB or WWPA.
- D. Roofing Nailers: Structural- or No. 2-grade lumber or better; kiln-dried Douglas fir, southern pine, or wood having similar decay-resistant properties.
- E. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

## 2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

## 2.6 FASTENERS

- A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
  - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 ICC-ES AC58 ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- E. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- F. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- G. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
  - 2. ICC-ES evaluation report for fastener.
- H. Securely attach roofing nailers to substrates by anchoring and fastening to withstand bending, shear, or other stresses imparted by Project wind loads and fastener-resistance loads as designed in accordance with ASCE/SEI 7.

### **3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS**

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Attach wood roofing nailers securely to substrate to resist the designed outward and upward wind loads indicated on Drawings and in accordance with ANSI/SPRI ED-1, Tables A6 and A7.
- D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### **3.3 INSTALLATION OF FLOOR JOIST FRAMING**

- A. General: Install floor joists with crown edge up.
- B. Provide solid blocking of 2-inch nominal thickness by depth of joist at ends of joists unless nailed to header or band.

END OF SECTION

## **SECTION 06 16 00 - SHEATHING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Wall sheathing.
  - 2. Subflooring.
- B. Related Requirements:
  - 1. Section 04 20 00 "Unit Masonry" for coordination of mockups.
  - 2. Section 06 10 00 "Rough Carpentry" for plywood backing panels.
  - 3. Section 07 27 26 "Fluid-Applied Membrane Air Barriers" for membrane application requirements.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review air-barrier application requirements over glass-mat gypsum sheathing, special details, transitions, mockups, protection, and work scheduling that covers air-barrier and glass-mat gypsum sheathing.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

#### **1.4 QUALITY ASSURANCE**

- A. Mockups: Build mockups to set quality standards for materials and execution. Provide backup for mockup as shown in Drawings or as specified in Section 04 20 00.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Resistance Ratings: As tested in accordance with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

#### **2.2 FIRE-RETARDANT-TREATED PLYWOOD**

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

- B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
  - 1. Use treatment that does not promote corrosion of metal fasteners.
  - 2. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
  - 3. Design Value Adjustment Factors: Treated lumber plywood is to be tested in accordance with ASTM D5516 and design value adjustment factors are to be calculated in accordance with ASTM D6305. Span ratings after treatment are to be not less than span ratings specified.
- C. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.
- D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.
- E. Application: Treat plywood indicated on Drawings, and the following:
  - 1. Subflooring and underlayment for raised platforms.

## 2.3 WALL SHEATHING

- A. Glass-Mat Gypsum Sheathing, Walls: ASTM C1177/C1177M.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Certainteed; SAINT-GOBAIN.
    - b. Continental Building Products, LLC.
    - c. Georgia-Pacific Gypsum LLC.
    - d. National Gypsum Company.
    - e. USG Corporation.
  - 2. Type and Thickness: Type X, 5/8 inch thick.
  - 3. Size: 48 by 96 inches for vertical installation.

## 2.4 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Subflooring: Either DOC PS 1 or DOC PS 2, Exposure 1 single-floor panels or sheathing.
  - 1. Span Rating: Not less than 16.
  - 2. Nominal Thickness: Not less than 23/32 inch or as indicated on Drawings.

## 2.5 FASTENERS

- A. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.
  - 1. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C954.

## 2.6 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 or ASTM D3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.



## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  - 1. Table 2304.10.1, "Fastening Schedule," in the ICC's International Building Code.
  - 2. ICC-ES evaluation report for fastener.
- D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

### **3.2 INSTALLATION OF WOOD STRUCTURAL PANEL**

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
  - 1. Subflooring:
    - a. Glue and screw to wood framing.

### **3.3 INSTALLATION OF GYPSUM SHEATHING**

- A. Comply with GA-253 and with manufacturer's written instructions.
  - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
  - 2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
  - 3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Horizontal Installation: Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.
  - 1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.

END OF SECTION

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## **SECTION 06 20 23 - INTERIOR FINISH CARPENTRY**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Interior trim.
  - 2. Shelving and clothes rods.
- B. Related Requirements:
  - 1. Section 06 10 00 "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
  - 2. Section 06 40 23 "Interior Architectural Woodwork" for shop-fabricated carpentry.

#### **1.2 DEFINITIONS**

- A. MDF: Medium-density fiberboard.
- B. MDO: Plywood with a medium-density overlay on the face.
- C. PVC: Polyvinyl chloride.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Interior trim.
  - 2. Shelving and clothes rods.
- B. Samples: For each exposed product and for each color and texture specified.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation.
  - 1. Protect materials from weather by covering with waterproof sheeting, securely anchored.
  - 2. Provide for air circulation around stacks and under coverings.
- B. Deliver interior finish carpentry materials only when environmental conditions comply with requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions comply with requirements specified for installation areas.

#### **1.5 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet-work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
  - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS, GENERAL**

- A. Composite Wood Products: Products shall be made without urea formaldehyde.
- B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.
  - 1. Factory mark each piece of lumber with grade stamp of grading agency.
  - 2. For exposed lumber, mark grade stamp on end or back of each piece, or omit grade stamp and provide certificates of grade compliance issued by grading agency.
- C. MDF: ANSI A208.2, Grade 130.
- D. Melamine-Faced Particleboard: Particleboard complying with ANSI A208.1, Grade M-2, finished on both faces with thermally fused, melamine-impregnated decorative paper and complying with ISO 4586-3, Grade VGS.
  - 1. Color: White.

### **2.2 INTERIOR TRIM**

- A. Hardwood Lumber Trim for Transparent Finish (Stain or Clear Finish):
  - 1. Species and Grade: As scheduled in the Interior Finishes Legend.
  - 2. Maximum Moisture Content: 10 percent.
  - 3. Finger Jointing: Not allowed.
  - 4. Gluing for Width: Not allowed.
  - 5. Veneered Material: Use for lumber trim wider than 6 inches.
  - 6. Face Surface: Surfaced (smooth).
  - 7. Matching: Selected for compatible grain and color.
- B. Hardwood Moldings for Transparent Finish (Stain or Clear Finish): MMPA WM 4, N-grade wood moldings made to patterns included in MMPA's "HWM/Series Hardwood Moulding Patterns."
  - 1. Species: As scheduled in Interior Finishes Legend.
  - 2. Maximum Moisture Content: 9 percent.
  - 3. Finger Jointing: Not allowed.
  - 4. Matching: Selected for compatible grain and color.
  - 5. Optional Material: Kiln-dried softwood or MDF, with exposed surfaces veneered with species indicated, may be used in lieu of solid wood.
  - 6. Profiles to match existing, or as detailed in drawings.

### **2.3 SHELVING AND CLOTHES RODS**

- A. Shelving: Utility shelving, made from the following material, 3/4 inch thick:
  - 1. Melamine-faced particleboard with applied-PVC front edge.
- B. Standards for Adjustable Shelf Brackets: BHMA A156.9, B04102; powder-coat-finished steel.
- C. Adjustable Shelf Brackets: BHMA A156.9, B04112; powder-coat-finished steel.
- D. Wood Clothes Rods: 1-1/2-inch- diameter, clear, kiln-dried Douglas fir or southern pine.
- E. Metal Rod Flanges: Aluminum, Chrome-plated steel, or Stainless steel.

## 2.4 MISCELLANEOUS MATERIALS

- A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
- B. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.
- C. Multipurpose Construction Adhesive: Formulation, complying with ASTM D3498, that is recommended for indicated use by adhesive manufacturer.

## 2.5 FABRICATION

- A. Back out or kerf backs of the following members, except those with ends exposed in finished work:
  - 1. Interior standing and running trim, except shoe and crown molds.
- B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours.

## 3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.
- B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials.
  - 1. Use concealed shims where necessary for alignment.
  - 2. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
  - 3. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
  - 4. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
  - 5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

### 3.4 INSTALLATION OF INTERIOR TRIM

- A. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available.
  - 1. Do not use pieces less than 24 inches long, except where necessary.
  - 2. Stagger joints in adjacent and related standing and running trim.
  - 3. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint.
  - 4. Use scarf joints for end-to-end joints.
  - 5. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
  - 6. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
  - 7. Install trim after gypsum-board joint finishing operations are completed.
  - 8. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting.
  - 9. Fasten to prevent movement or warping.
  - 10. Countersink fastener heads on exposed carpentry work and fill holes.

### 3.5 INSTALLATION OF SHELVING AND CLOTHES RODS

- A. Install standards for adjustable shelf brackets according to manufacturer's written instructions, spaced not more than 36 inches o.c. and within 6 inches of ends of shelves. Fasten to framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.
- B. Cut shelves to neatly fit openings with only enough gap to allow shelves to be removed and reinstalled.
  - 1. Install shelves, fully seated on cleats, brackets, and supports.
  - 2. Fasten shelves to brackets to comply with bracket manufacturer's written instructions.
- C. Install rod flanges for rods as indicated.
  - 1. Fasten to shelf cleats, framing members, blocking, or metal backing, or use toggle bolts or hollow wall anchors.
  - 2. Install rods in rod flanges.

### 3.6 ADJUSTING

- A. Replace interior finish carpentry that is damaged or does not comply with requirements.
  - 1. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.
- B. Adjust joinery for uniform appearance.

### 3.7 CLEANING

- A. Clean interior finish carpentry on exposed and semiexposed surfaces.
- B. Restore damaged or soiled areas and touch up factory-applied finishes if any.

### 3.8 PROTECTION

- A. Protect installed products from damage from weather and other causes during construction.
- B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.
  - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

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## **SECTION 06 40 00 - ARCHITECTURAL WOODWORK**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Shop fabricated cabinetwork, casework, counters, shelves, and other architectural woodwork items.
  - 2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-clad architectural cabinets that are not concealed within other construction.
- B. Related Requirements:
  - 1. Section 06 10 00 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.

#### **1.3 REFERENCES**

- A. AWS - Architectural Woodwork Standards (Current Edition)
  - 1. Published jointly by the Architectural Woodwork Institute, Architectural Woodwork Manufacturer Association of Canada, and Woodwork Institute.
- B. NEMA - National Electrical Manufacturers Association
  - 1. LD3 - High Pressure Decorative Laminates
- C. HPVA - Hardwood Plywood & Veneer Association
  - 1. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood
- D. ANSI - American National Standards Institute
  - 1. ANSI A208.1 - Particleboard
  - 2. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications

#### **1.4 DEFINITIONS**

- A. Refer to AWS Section 10 - Casework for definitions of exposed (exterior and interior), semi-exposed, and concealed surfaces.
- B. For the purpose of factory finishing, both sides of cabinet doors shall be considered "exposed".

#### **1.5 SUBMITTALS**

- A. Product Data: Submit for each type of product and process specified and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- B. Quality Certification: Submit woodwork fabricator's certification, stating that fabricated woodwork complies with quality grades and other requirements indicated.
- C. Shop Drawings: Submit in conformance with the requirements of the Architectural Woodwork Standards.
- D. Samples: Submit the following samples:
  - 1. Plastic laminate, 8-inch x 8-inch for each type, color, pattern and surface finish.
  - 2. Wood veneer, 8-inch x 8-inch for each species and cut, and finish.

3. Wood lumber, not less than 5 inches wide by 12 inches long, for each species and cut, finished one side and one edge.
4. Exposed cabinet hardware, one unit of each type and finish.
5. Drawer body material, 8-inch x 8-inch size.
6. Solid surface material, 8-inch x 8-inch for each type, color, and edge detail.

#### 1.6 QUALITY ASSURANCE

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of architectural woodwork indicated for construction, finishes, installation, and other requirements.
- B. Fabricator Qualifications: Firm with minimum 5 years experience in producing architectural woodwork similar in type and quality to those required for this project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units without delaying the Work.
- C. Factory-mark each piece of lumber and plywood with type, grade, mill and grading agency identification; except omit marking from surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver woodwork, until painting, wet work, grinding and similar operations that could damage, soil or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

#### 1.8 FIELD CONDITIONS

- A. Architectural woodwork fabricator and installer shall advise Prime Contractor of indoor temperature and humidity requirements for woodwork installation and storage areas. Do not install woodwork until indoor temperature and humidity are within the range recommended by the "Architectural Woodwork Standards" for the location of the Project and will be maintained in installation and storage areas.
- B. Field Measurements: Where architectural woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed, and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where architectural woodwork is indicated to fit to other construction, establish dimensions for areas where architectural woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

#### 1.9 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork can be supported and installed as indicated.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. General:

1. Provide materials that comply with requirements of the "Architectural Woodwork Standards" for each type of woodwork and quality grade indicated and, where the following products are part of interior woodwork, with requirements of the referenced product standards that apply to product characteristics indicated.
2. Optimum Moisture Content: Kiln-dry architectural woodwork to an average moisture content of 8 percent or as otherwise recommended by applicable "Architectural Woodwork Standards" for the regional climatic conditions involved.

#### B. Dowels: Hardwood

#### C. Softwood Plywood: APA A-B EXT - Group 1, made without urea-formaldehyde adhesive.

#### D. Veneer Faced Panel Products (Hardwood Plywood): HPVA HP-1, made without urea-formaldehyde adhesive.

#### E. Fiberboard: Medium density complying with ANSI A208.2, made with binder containing no urea-formaldehyde resin.

#### F. Particleboard: ANSI A208.1, made with binder containing no urea-formaldehyde resin.

#### G. Fasteners and Anchorages: Provide all nails, screws, bolts, nuts, washers, and other anchoring devices of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.

#### H. Miscellaneous lumber for blocking, furring, cabinet bases: Provide materials and comply with provisions as specified in Section 06 10 00.

### 2.2 LAMINATE CLAD ARCHITECTURAL CABINETS

#### A. Quality Standards: Comply with AWS Section 10 - Casework.

1. Grade: Custom.
2. Cabinet Construction: Type A, frameless with cabinet and door Interface Style 1, flush overlay.
3. Core Material: ANSI A208.1, Type M-3 particleboard.
4. Laminate Cladding: High pressure decorative laminate complying with NEMA LD3 and as follows:
  - a. Manufacturers/Products/Colors: As scheduled in Interior Finish Legend.
  - b. Exposed Surfaces (other than edges):
    - 1) Horizontal Surfaces: HGS (0.048-inch nominal thickness).
    - 2) Postformed Surfaces: HGP (0.039-inch nominal thickness).
  - c. Vertical Surfaces: VGP (0.028-inch nominal thickness).
  - d. Semi-Exposed Surfaces (other than edges): Decorative surface of thermally fused polyester or melamine laminated to core under pressure and complying with NEMA LD3 GP28 and LD3 CL20 standards. Vinyl overlays not acceptable. Painted material not acceptable.
  - e. Exposed Edges of Laminated Components:
    - 1) Body Members and Shelves: HPL matching exposed faces.
    - 2) Doors and Drawers: HPL matching exposed faces.

- 3) Concealed Laminate: Where balancing sheet is indicated or required by referenced quality standards, provide backer type laminate, grade designation BK-20 (0.020-inch nominal thickness) complying with NEMA LD3 CL20 standards.

## 2.3 WOOD ARCHITECTURAL CABINETS

- A. Quality Standards: Comply with AWS Section 10 - Casework.
- B. Wood Cabinets for Transparent Finish:
  1. Grade: Premium.
  2. Cabinet Construction: Type A, frameless with cabinet and door Interface Style 1, flush overlay.
  3. Wood Species for Exposed Surfaces: As noted in Drawings and scheduled in Interior Finish Legend
  4. Wood Species for Semi-Exposed Surfaces: Match species and cut indicated for exposed surfaces.
    - a. Concealed Surfaces: Solid hardwood or hardwood plywood, any species.
  5. Grain Matching: Run and match grain vertically for drawer fronts, doors, and fixed panels.

## 2.4 THICKNESS AND MATERIALS FOR CABINET COMPONENTS

COMPONENTS	MATERIALS	MINIMUM THICKNESS OF MATERIALS
Body Members	Panels	3/4-inch
Rails	Solid Lumber or Panel	3/4-inch
Shelves	Panels	3/4-inch for spans up to 32-inch
Shelves exceeding spans indicated require additional support	Medium Density Particle board or Fiberboard	1-inch for spans up to 42-inch
Backs	Panels	3/8-inch
Drawer Sides, Backs, and Subfronts	Solid Lumber or Particleboard Panel	1/2-inch Lumber 1/2-inch (50# density or more)
Drawer Bottoms	Panels	3/8-inch
Drawer Fronts	Panels	3/4-inch
Doors	Panels	3/4-inch; up to 30 inches wide by 80 inches high 1-inch; over 30 inches wide by 80 inches high

## 2.5 ARCHITECTURAL CABINET TOPS, COUNTERS, AND SHELVES

- A. Quality Standards: Comply with AWS Section 11 - Countertops.
- B. Laminate Clad Tops:
  1. Grade: Custom.
  2. Core Material: ANSI A208.1, Type 2-M-2 particleboard (1-inch thick). Provide balancing sheet (BK-20) on all surfaces that do not have high-pressure decorative laminate.

3. Front Edge: Straight with PVC edge matching plastic laminate unless otherwise indicated on Drawings.
4. Back Splash: Butt joint except provide coved for tops in all wet areas; 4-inches high unless otherwise indicated on Drawings. Provide square with scribe top at splash.
5. Laminate Cladding: High pressure decorative laminate complying with NEMA LD 3 and as follows:
  - a. Manufacturers/Products/Colors: As scheduled in Interior Finish Legend.
  - b. Horizontal Surfaces: HGS (0.048-inch nominal thickness).
  - c. Postformed Surfaces: HGP (0.039-inch nominal thickness).
  - d. Edge Treatment: Same as laminate cladding on horizontal surfaces.

C. Solid Surface Countertops:

1. Grade: Custom.
2. Material: Homogeneous solid sheets of filled plastic resin complying with the material and performance requirements of ANSI Z124.3, Type 5 or Type 6, without a precoated finish.
3. Thickness: 1/2-inch thick unless otherwise noted.
4. Front Edge: Waterfall unless otherwise indicated on Drawings.
5. Back Splash: Applied butt joint; 4-inches high unless otherwise indicated on Drawings. Provide square top at splash.
6. Basis-of-Design Products: Subject to compliance with requirements, provide each product indicated in the Interior Finish Legend or an equivalent product of type, pattern, and color by one of the following:
  - a. Avonite
  - b. Corian; DuPont Polymers
  - c. Gibraltar; Ralph Wilson Plastics Company
  - d. Hi-Macs
  - e. Meganite, Inc.
  - f. Romanite

## 2.6 CABINET HARDWARE

A. Basis-of-Design Products: Products specified below indicate quality and function. Subject to compliance with requirements, equivalent products by other manufacturers may be provided.

1. Drawer Slides: Accuride 7432; except Accuride 3640 Series for drawers over 24 inches wide.
2. Wire Pulls: Mockett DP105c/4 x US26D
3. Hinges: Grass Tiomos 110 Series, self-closing, number of hinges per door as follows:
  - a. 2 per door up to 24 inches wide by 35-1/2 inches high
  - b. 3 per door up to 24 inches wide by 63 inches high
  - c. 4 per door up to 24 inches wide by 78-3/4 inches high
  - d. 5 per door up to 24 inches wide by 94-1/2 inches high
4. Hinges for Inside Secure Perimeter: Heavy-duty, five knuckle 2-3/4 inch institutional type hinge complying with ANSI/BHMA A156.9, Grade 1 requirements. Finish: Epoxy coated.
5. Shelf Support: Double pin design with anti-tip shelf restraints, equivalent to Bainbridge Manufacturing 3220CL.
6. Courtroom Gate Hinges: McKinney 4007MRB x US26D
7. Courtroom Gate Stop/Holder: Ives 449 x aluminum
8. Locks: KV 986 NP (each lock keyed alike by room and master keyed)
9. Closet Rod: KV 28P ZC
10. Shelf Standards: KV 87 ANO
11. Shelf Brackets: KV 187LL ANO
12. Trash Bin Slides : KV USC series in platinum with two waste bins
13. Grommets: Purpose made round wire management grommets; black

14. Label Holder: 3/4" high by 2-3/8" wide purpose made label holder at each opening on mailboxes; nickel plated.

## 2.7 DISPLAY CASE HARDWARE

- A. Basis-of-Design Products: Products specified below indicate quality and function. Subject to compliance with requirements, equivalent products by other manufacturers may be provided.
- B. Single-sided Display Case:
  1. Shelf Standards: KV 87
  2. Shelf Brackets: KV 187 with purpose made shelf rests for glass shelves

## 2.8 ACCESSORY ITEMS

- A. Tackable Panels: Equivalent to Claridge No. 550 comprised of 1/4-inch cork laminated to 1/4-inch hardboard substrate with fabric wall covering wrapped over the panel face and edges and returned to the back of the panel. Ensure flat wrinkle free surfaces and tailored corners. Fabric: As scheduled in Interior Finish Legend.
- B. Countertop Steel Support Brackets: Equivalent to A&M Hardware, Inc. (1-888-647-0200), 1/8-inch thick steel workstation brackets with manufacturer's standard powder coat finish in color selected by A/E from manufacturer's full range. See Drawings for sizes and locations.
- C. Armor Panels: UL 752 listed, Level 3 rated bullet resistant fiberglass panel equivalent to ArmorCore as manufactured by Waco Composites, Ltd., 7/16 inch thick, unless otherwise indicated.

## 2.9 FABRICATION

- A. Fabricate architectural woodwork to dimensions, profiles, and details indicated with openings and mortises precut, where possible, to receive hardware and other items and work.
- B. Fabricate solid surface countertops in one piece with shop-applied backsplashes and edges, unless otherwise indicated. Comply with solid surface material manufacturer's recommendations for adhesives, sealers, fabrication, and finishing.
- C. Complete fabrication, including assembly, finishing, hardware application, and other work to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- D. Pre-Cut Openings: Fabricate architectural woodwork with pre-cut openings, where possible, to receive hardware, appliances, plumbing fixtures, electrical work and similar items. Locate openings accurately from on-site dimensions and use templates or roughing-in diagrams for proper size and shape. Smooth edges of cutoffs and, where located in countertops and similar exposures seal edges of cutouts with a water-resistant coating.
- E. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain field measurements and verify dimensions and shop drawing details as required for accurate fit.

## 2.10 JOINERY AND FASTENING OF CASE BODY MEMBERS

- A. Fixed case body members (shelves, bottoms, tops and rails which are fastened to sides, ends and dividers) shall be joined using concealed dado, or dowel matched or interlocking mechanical fasteners. Where the concealed dado and dowel methods are employed, cases shall be assembled utilizing glue and pressure. The dado method must be reinforced with blind nailing or screwing.

- B. No nails, screws or other fastenings may be visible on exposed surfaces. On semi-exposed surfaces, mechanical fasteners may be visible.
- C. Rails or top panels must be provided where case will have a separate top in order to permit concealed fastening of the separate top through such rails.
- D. Where not in violation of design, surfaces of intersecting body members may be set back not to exceed 1/8 inch, provided setback is constant.

#### 2.11 BACKPRIMING

- A. Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork in contact with cementitious materials. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative overlay.

#### 2.12 SHOP FINISHING

- A. Preparations for Finishing: Set exposed nails and screws. Apply wood filler in exposed nail and screw. Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
- B. General:
  1. Comply with AWS Section 5 - Finishing, unless otherwise indicated. Provide finishes of same grades as items to be finished.
  2. Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
  3. Transparent Finish System: AWS System - 5 Conversion Varnish.
  4. Staining: Match A/E approved sample for color.
  5. Sheen: Satin, 31-45 Gloss units measured on 60-degree gloss meter per ASTM D 523.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Before installation, condition architectural woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

#### 3.2 INSTALLATION

- A. Quality Standard: Install architectural woodwork to comply with "Architectural Woodwork Standards" for the same grade specified in PART TWO of this Section for type of architectural woodwork involved.
- B. Assemble architectural woodwork and complete fabrication at Project site to the extent that it was not completed in the shop.
- C. Install architectural woodwork plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8-feet for plumb and level (including tops); and with no variations in flushness of adjoining surfaces.
- D. Scribe and cut architectural woodwork to fit adjoining work, leaving gaps of 1/32-inch maximum, and refinish cut surfaces or repair damaged finish at cuts. Do not use additional overlay trim for this purpose.

- E. Anchor architectural woodwork to anchors or blocking built-in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
  - F. For shop finished items use filler matching final finish of items being installed.
  - G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.
  - H. Tops: Anchor securely to base units and other support systems as required. Caulk space between backsplash and wall with sealant.
  - I. Armor Panels:
    - 1. Install panels on threat side. Fully support weight of armor panels. Overlap panel ends at corners.
    - 2. Stagger joints so they are not located over framing members. Reinforce joints with 4 inch wide back-up layer of same UL listed level panel material, centered on panel joint, and fasten per manufacturer's installation instructions.
    - 3. Provide 12 inch high by width of framing spacing, backer panel of the same UL listed level panel material behind electrical, data, and other penetrations through armor wall panels. Place backer panel tight to penetrating assembly.
- 3.3 CLEANING, ADJUSTMENT, AND PROTECTION
- A. Cleaning: Clean all work of this Section prior to acceptance by Owner. Repair damaged and defective architectural woodwork where possible to eliminate defects functionally and visually. Where not possible to repair, replace woodwork at no cost to Owner. Adjust joinery for uniform appearance.
  - B. Adjustment: Clean, lubricate and adjust hardware for proper operation.
  - C. Protection: Protect all work of this Section until acceptance by Owner. Advise Prime Contractor of final protection and maintained conditions necessary to ensure that architectural woodwork will be without damage or deterioration at time of acceptance.

End of Section 06 40 00



## **SECTION 06 42 16 - FLUSH WOOD PANELING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Flush wood paneling (wood-veneer wall surfacing).
  - 2. Fire-retardant-treated materials.
  - 3. Installation materials.
- B. Related Requirements:
  - 1. Section 06 10 00 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing paneling that is concealed within other construction before paneling installation.
  - 2. Section 08 14 16 "Flush Wood Doors" for flush wood doors to be sequenced into flush wood paneling.

#### **1.2 COORDINATION**

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: For flush wood paneling.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Show locations and sizes of furring and blocking, including concealed blocking specified in other Sections.
  - 3. For paneling veneered in fabrication shop, show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
- C. Samples for Verification: For the following:
  - 1. Lumber for Transparent Finish: Not less than 5 inches wide by 12 inches long, for each species and cut, finished on one side and one edge.
  - 2. Veneer Leaves: Representative of and selected from flitches to be used for transparent-finished paneling.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer and fabricator.
- B. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

## 1.6 QUALITY ASSURANCE

- A. Fabricator and Installer Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance with at least 5 years' experience with a minimum of 5 successfully completed projects.

## 1.7 MOCKUPS

- A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
  - 1. Build mockups of typical paneling as shown on Drawings.
  - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver paneling until painting and similar operations that might damage paneling have been completed in installation areas. Store paneling in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

## 1.9 FIELD CONDITIONS

- A. Environmental Limitations without Humidity Control: Do not deliver or install paneling until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Environmental Limitations with Humidity Control: Do not deliver or install paneling until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- C. Field Measurements: Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Locate concealed framing, blocking, and reinforcements that support paneling by field measurements before being enclosed/concealed by construction and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where paneling is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

## PART 2 - PRODUCTS

### 2.1 SOURCE LIMITATIONS

- A. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of paneling and wood doors faced with veneers from same flitches as paneling.

### 2.2 PANELING, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of flush wood paneling (wood-veneer wall surfacing) indicated for construction, finishes, installation, and other requirements.

1. The Contract Documents contain requirements that are more stringent than the referenced woodwork quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.

## 2.3 FLUSH WOOD PANELING (WOOD-VENEER WALL SURFACING)

- A. Grade: Premium.
- B. Wood Species and Cut: Red Oak, plain sliced.
- C. Veneer Matching Method:
  1. Adjacent Veneer Leaves: Slip match.
  2. Within Panel Face: Center-balance match.
- D. Panel-Matching Method:
  1. Made-to-order, sequence-matched panels within each separate area.
- E. Vertical Panel-Matching Method: Panel end slip match; panels are slip matched from lower panels to upper panels.
- F. Panel Core Construction: Fire-retardant particleboard or fire-retardant MDF.
  1. Thickness: 3/4 inch.
- G. Exposed Panel Edges: Inset solid-wood or wood-veneer matching faces.
- H. Panel Reveals: Black paint on support wall.
- I. Fire-Retardant-Treated Paneling: Panels are to consist of wood-veneer and fire-retardant particleboard or fire-retardant, medium-density fiberboard (MDF). Panels are to have a flame-spread index of 25 or less and a smoke-developed index of 450 or less per ASTM E84, and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
- J. Assemble panels by gluing and concealed fastening.

## 2.4 MATERIALS

- A. Materials, General: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
- B. Wood Moisture Content: 5 to 10 percent.
- C. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
  1. Composite Wood Products: Products shall be made without urea formaldehyde.
- D. Adhesives: Do not use adhesives that contain urea formaldehyde.

## 2.5 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
  1. Use treated materials that comply with requirements of referenced quality standard. Do not use materials that are warped, discolored, or otherwise defective.
  2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.

3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.
- B. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested according to ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
1. Kiln-dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.
  2. For items indicated to receive a stained or natural finish, use organic resin chemical formulation.
  3. Mill lumber before treatment and implement procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of paneling.
- C. Fire-Retardant Particleboard: Made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E84.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Arauco North America.
    - b. Timber Products Company.
  2. For panels 13/16 to 1-1/4 inches thick, comply with ANSI A208.1 for Grade M-1 except for the following minimum properties: modulus of rupture, 1300 psi; modulus of elasticity, 250,000 psi; linear expansion, 0.50 percent; and screw-holding capacity on face and edge, 250 and 175 lbf, respectively.
- D. Fire-Retardant Fiberboard: MDF panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E84.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Roseburg.
- 2.6 INSTALLATION MATERIALS
- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls.
- 2.7 FABRICATION
- A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- B. Complete fabrication, including assembly, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

- C. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

## 2.8 SHOP FINISHING

- A. General: Finish paneling at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing paneling, as applicable to each unit of work.
  - 1. Backpriming: Apply two coats of sealer or primer, compatible with finish coats, to concealed surfaces of paneling.
- C. Transparent Finish:
  - 1. Grade: Premium.
  - 2. Finish: System - 5, conversion varnish.
  - 3. Staining: Match Architect's sample.
  - 4. Filled Finish for Open-Grain Woods: After staining, apply wash-coat sealer and allow to dry. Apply paste wood filler and wipe off excess. Tint filler to match stained wood.
  - 5. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D523.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Before installation, condition paneling to humidity conditions in installation areas.
- B. Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

### 3.2 INSTALLATION

- A. Grade: Install paneling to comply with quality standard grade of paneling to be installed.
- B. Install paneling level, plumb, true in line, and without distortion. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches. Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.
  - 1. For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels not exceeding 1/16 inch.
- C. Anchor paneling to supporting substrate with concealed panel-hanger clips.
  - 1. Do not use face fastening unless covered by trim.
- D. Complete finishing work specified in this Section to extent not completed at shop or before installation of paneling. Fill nail holes with matching filler where exposed.

### 3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective paneling, where possible, to eliminate defects. Where not possible to repair, replace paneling. Adjust for uniform appearance.
- B. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

**DIVISION 07**





## **SECTION 07 11 13 - BITUMINOUS DAMPPROOFING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Cold-applied, emulsified-asphalt dampproofing.
- B. Related Requirements:
  - 1. Section 03 30 00 "Cast-in-Place Concrete" for vapor retarders under slabs-on-grade.

#### **1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product.

#### **1.3 FIELD CONDITIONS**

- A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.
- B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

### **PART 2 - PRODUCTS**

#### **2.1 SOURCE LIMITATIONS**

- A. Source Limitations: Obtain primary dampproofing materials and primers from single source from single manufacturer. Provide insulation, drainage panels and auxiliary materials recommended in writing by manufacturer of primary materials.

#### **2.2 PERFORMANCE REQUIREMENTS**

- A. VOC Content: Products are to comply with VOC content limits of authorities having jurisdiction unless otherwise indicated.

#### **2.3 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. ChemMasters, Inc.
  - 2. Euclid Chemical Company (The); an RPM company.
  - 3. Henry Company.
  - 4. Master Builders Solutions.
  - 5. W.R. Meadows, Inc.
  - 6. <Insert manufacturer's name>.
- B. Fibered Brush and Spray Coats: ASTM D1227, Type II, Class 1.
- C. Brush and Spray Coats: ASTM D1227, Type III, Class 1.

#### **2.4 AUXILIARY MATERIALS**

- A. Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.

- B. Emulsified-Asphalt Primer: ASTM D1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.
- C. Asphalt-Coated Glass Fabric: ASTM D1668/D1668M, Type I.
- D. Patching Compound: Asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.
- E. Extruded-polystyrene board insulation, unfaced, ASTM C578, Type IV, thickness as indicated on Drawings.

## 2.5 MOLDED-SHEET DRAINAGE PANELS

- A. Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel acceptable to dampproofing manufacturer and consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 sieve laminated to one side of the core, with or without a polymeric film bonded to the other side; and with a vertical flow rate through the core of 9 to 21 gpm per ft..
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Carlisle Coatings & Waterproofing Inc; Carlisle Construction Materials.
    - b. GCP Applied Technologies Inc.
    - c. Master Builders Solutions.
    - d. Polyguard Products, Inc.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for surface smoothness, maximum surface moisture content, and other conditions affecting performance of the Work.
- B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for dampproofing application.
- B. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
- C. Clean substrates of projections and substances detrimental to dampproofing work; fill voids, seal joints, and remove bond breakers if any.
- D. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections. Reinforce patch as required by system manufacturer.

### 3.3 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless otherwise indicated.
  - 1. Apply dampproofing to provide continuous plane of protection.

2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.
  - B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches over outside face of footing.
    1. Extend dampproofing 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
    2. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where indicated as "reinforced," by embedding an 8-inch- wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat for embedding fabric is in addition to other coats required.
  - C. Where dampproofing interior face of above-grade, exterior concrete walls, continue dampproofing through intersecting walls by keeping vertical mortar joints at intersection temporarily open or by dampproofing wall before constructing intersecting walls.
- 3.4 INSTALLATION OF COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING
- A. Concrete Foundations and Parged Masonry Foundation Walls: Apply two brush or spray coats at not less than 1.5 gal./100 sq. ft. for first coat and 1 gal./100 sq. ft. for second coat or one fibered brush or spray coat at not less than 3 gal./100 sq. ft..
  - B. Concrete Backup for Masonry Veneer Assemblies: Apply one brush or spray coat at not less than 1 gal./100 sq. ft..
- 3.5 INSTALLATION OF INSULATION COURSE
- A. Install insulation course over completed-and-cured dampproofing. Comply with dampproofing-material and insulation manufacturers' written instructions for attaching insulation course.
    1. Support insulation course over cured coating with spot application of adhesive type recommended in writing by protection-board manufacturer.
- 3.6 INSTALLATION OF DRAINAGE PANEL
- A. Molded-Sheet Drainage Panels: Install panels, with geotextile facing away from wall substrate, according to manufacturer's written instructions. Use adhesive or another method that does not penetrate dampproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
    1. Install insulation course before installing drainage panels.
- 3.7 PROTECTION
- A. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where panels are subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
  - B. Correct dampproofing that does not comply with requirements; repair substrates, and reapply dampproofing.

END OF SECTION

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## **SECTION 07 21 00 - THERMAL INSULATION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Extruded polystyrene foam-plastic board insulation.
  - 2. Phenolic thermoset rainscreen board insulation
  - 3. Mineral-wool board insulation.
  - 4. Bearing polyurethane foam insulation.
  - 5. Structural thermal break.
- B. Related Requirements:
  - 1. Section 07 53 23 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing" for insulation specified as part of roofing construction.
  - 2. Section 09 29 00 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Extruded polystyrene foam-plastic board insulation.
  - 2. Phenolic thermoset rainscreen board insulation
  - 3. Mineral-wool board insulation.
  - 4. Bearing insulation.
  - 5. Structural thermal break.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
  - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
  - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
  - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

### **PART 2 - PRODUCTS**

#### **2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION**

- A. Extruded Polystyrene Board Insulation, Type IV, for Use Below Grade: ASTM C578, Type IV, 25-psi minimum compressive strength; unfaced.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. DiversiFoam Products.
  - b. Dow Chemical Company (The).
  - c. Kingspan Insulation Limited.
  - d. Owens Corning.
2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than 450 when tested in accordance with ASTM E84.
4. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

## 2.2 MINERAL-WOOL BLANKET INSULATION

- A. Mineral-Wool Blanket Insulation, Unfaced : ASTM C665, Type I (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.
  1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
  2. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.
  3. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

## 2.3 MINERAL-WOOL BOARD INSULATION

- A. Mineral-Wool Board Insulation, Type II, Unfaced for Use In Cavity Wall Construction: ASTM C612, Type II; passing ASTM E136 for combustion characteristics.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Johns Manville; a Berkshire Hathaway company.
    - b. Rockwool International.
    - c. Thermafiber, Inc.; an Owens Corning company.
  2. Nominal Density: 6 lb/cu. ft..
  3. Flame-Spread Index: Not more than 15 when tested in accordance with ASTM E84.
  4. Smoke-Developed Index: Not more than zero when tested in accordance with ASTM E84.
  5. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.
- B. Mineral-Wool Board Insulation, Type III, Faced: ASTM C612, Type III; faced on one side with foil-scrim or foil-scrim-polyethylene vapor retarder.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Johns Manville; a Berkshire Hathaway company.
    - b. Rockwool International.
    - c. Thermafiber, Inc.; an Owens Corning company.
  2. Nominal Density: 8 lb/cu. ft..
  3. Flame-Spread Index: Not more than 15 when tested in accordance with ASTM E84.
  4. Smoke-Developed Index: Not more than zero when tested in accordance with ASTM E84.
  5. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

## 2.4 BEARING POLYURETHANE FOAM INSULATION

- A. Bearing Polyurethane Foam Insulation: For use in bearing applications as indicated in Drawings.
1. Manufacturers: Subject to compliance with requirements, provide General Plastics Manufacturing Company; Last-A-Foam R-9300 series or equivalent products by one of the following:
    - a. Armatherm
    - b. Dow Chemical Company (The).
    - c. Jasper Plastics
  2. Density: Not less than 20 lb/cu. ft when tested in accordance with ASTM D-1622.
  3. Compressive Strength Parallel to Rise at 2% Deflection: Not less than 350 psi when tested in accordance with ASTM D1621.
  4. R-Value: Not less than 2.58 per inch when tested in accordance with ASTM C518.

## 2.5 STRUCTURAL THERMAL BREAK

- A. Structural Thermal Break: For use in bearing applications as indicated in Drawings.
1. Manufacturers: Subject to compliance with requirements provide one of the following products:
    - a. Armatherm; Armatherm FRR
    - b. Fabreeka International, Inc.; Fabreeka-Tim.
    - c. Farrat Isolevel Ltd; Farrat Structural Thermal Break.
    - d. Schöck USA, Inc.; Schöck Isokorb
  2. Density: Not less than 100 lb/cu. ft.
  3. Minimum Ultimate Mechanical Properties, Nominal:
    - a. Tensile Strength, ASTM D 638: 11,000 psi (75.8 MPa).
    - b. Flexural Strength, ASTM D 790: 25,000 psi (172.4 MPa).
    - c. Compressive Strength, ASTM D 695: 38,900 psi (268.2 MPa).
    - d. Compressive Modulus, ASTM D 695: 291,194 psi (2,007.7 MPa)
      - 1) 1/2-Inch (12.7 mm) Thickness: 291,194 psi (2,007.7 MPa).
      - 2) 1-Inch (25.4 mm) Thickness: 519,531 psi (3,582.0 MPa).
    - e. Shear Strength, ASTM D 732: 15,000 psi (103.4 MPa).
    - f. Operating Temperature Range: Minus 20 degrees F to 250 degrees F (Minus 29 degrees C to 121 degrees C).
      - 1) Maximum Loss in Ultimate Strength at 250 degrees F (121 degrees C): 30 percent.

## 2.6 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.
- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
- C. Foil Faced Insulation Tape: Product capable of bonding to foil faced insulation and adjacent substrates to provide a complete, air-tight seal, 3M Venture Tape Reinforced Aluminum Foil Tape or equivalent.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

### **3.2 INSTALLATION, GENERAL**

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Install insulation with manufacturer's R-value label exposed after insulation is installed.
- D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

### **3.3 INSTALLATION OF SLAB INSULATION**

- A. On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.
  - 1. If not otherwise indicated, extend insulation a minimum of 48 inches below exterior grade line.
- B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
  - 1. If not otherwise indicated, extend insulation a minimum of 48 inches in from exterior walls.

### **3.4 INSTALLATION OF FOUNDATION WALL INSULATION**

- A. Butt panels together for tight fit.
- B. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

### **3.5 INSTALLATION OF CAVITY-WALL INSULATION**

- A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face and as recommended by manufacturer.
  - 1. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.
  - 2. Press units firmly against inside substrates.
  - 3. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 04 20 00 "Unit Masonry."
- B. Mineral-Wool Board Insulation: Install insulation fasteners 4 inches from each corner of board insulation, at center of board, and as recommended by manufacturer.
  - 1. Fit courses of insulation between masonry wall ties and other obstructions, with edges butted tightly in both directions, and with faces flush.
  - 2. Press units firmly against inside substrates.



### 3.6 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Where indicated, install in cavities formed by framing members according to the following requirements:
  - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
  - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.
  - 2. Mineral Fiber Batt: Apply only where indicated.

### 3.7 INSTALLATION OF CURTAIN-WALL INSULATION

- A. Install board insulation in curtain-wall construction according to curtain-wall manufacturer's written instructions.
  - 1. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass.
  - 2. Maintain cavity width of dimension indicated on Drawings between insulation and glass.
  - 3. Install insulation to fit snugly without bowing.

### 3.8 INSTALLATION OF FOIL FACED INSULATION

- A. Install sheet reflective insulation according to ASTM C727.
  - 1. Seal foil face to adjacent construction utilizing foil tape. Seal all gaps for a complete, airtight installation.

### 3.9 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

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## **SECTION 07 21 19 - FOAMED-IN-PLACE INSULATION**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Closed-cell spray polyurethane foam insulation.
  - 2. Accessories.
- B. Related Requirements:
  - 1. Section 07 21 00 "Thermal Insulation" for foam-plastic board insulation.

#### **1.2 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Closed-cell spray polyurethane foam insulation.
  - 2. Accessories.

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: For each product, for tests performed by qualified testing agency.
- B. Qualification Statements: For Installer.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

### **PART 2 - PRODUCTS**

#### **2.1 CLOSED-CELL SPRAY POLYURETHANE FOAM INSULATION**

- A. Closed-Cell Spray Polyurethane Foam: ASTM C1029, Type II, minimum density of 1.5 lb/cu. ft. and minimum aged R-value at 1-inch thickness of 6.2 deg F x h x sq. ft./Btu at 75 deg F.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Carlisle Spray Foam Insulation.
    - b. Gaco; a brand of Firestone Building Products.
    - c. Henry Company.
    - d. Johns Manville; a Berkshire Hathaway company.
    - e. Master Builders Solutions.
  - 2. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: 25 or less.
    - b. Smoke-Developed Index: 450 or less.

#### **2.2 ACCESSORIES**

- A. Primer: Material recommended by insulation manufacturer where required for adhesion of insulation to substrates.
- B. Ignition Barrier: Material providing a 15-minute minimum fire-ignition barrier.
  - 1. Gypsum Wallboard: 0.5-inch minimum thickness.

2. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - a. Flame-Spread Index: 25 or less.
  - b. Smoke-Developed Index: 50 or less.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.
- B. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

#### **3.2 INSTALLATION**

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Spray insulation to envelop entire area to be insulated and fill voids.
- C. Apply in multiple passes to not exceed maximum thicknesses recommended by manufacturer. Do not spray into rising foam.
- D. Framed Construction: Install into cavities formed by framing members to achieve thickness indicated on Drawings.
- E. Miscellaneous Voids: Apply according to manufacturer's written instructions.
- F. Install ignition barrier material.
  1. Do not cover insulation prior to any required spray foam insulation inspections.

#### **3.3 PROTECTION**

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

END OF SECTION

**SECTION 07 24 19 - WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM  
(EIFS)**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Water-drainage exterior insulation and finish system (EIFS).
  - 1. Repair of disturbed areas of existing EIFS with EIFS-clad drainage-wall assemblies that are field applied over substrate.
- B. Related Requirements:
  - 1. Section 01 22 00 "Unit Prices."
  - 2. Section 01 23 00 "Allowances."
  - 3. Section 07 27 26 "Fluid-Applied Membrane Air Barriers" for fluid-applied, synthetic polymer air barriers applied over sheathing behind EIFS-clad wall assemblies.

**1.2 DEFINITIONS**

- A. Definitions in ASTM E2110 apply to Work of this Section.
- B. EIFS: Exterior insulation and finish system(s).
- C. IBC: International Building Code.

**1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each EIFS component, trim, and accessory.

**1.5 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For cementitious materials and aggregates and for insulation and joint sealant, from manufacturer.
- B. Product Test Reports: For each EIFS assembly and component, for tests performed by a qualified testing agency.

**1.6 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For EIFS to include in maintenance manuals.

**1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.
- B. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.
  - 1. Stack insulation board flat and off the ground.
  - 2. Protect plastic insulation against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
  - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

## 1.8 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air, humidity, and substrate temperatures permit EIFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.
1. Proceed with installation of adhesives or coatings only when ambient temperatures have remained, or are forecast to remain, above 40 deg F for a minimum of 24 hours before, during, and after application. Do not apply EIFS adhesives or coatings during rainfall.

## 1.9 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of EIFS-clad drainage-wall assemblies that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
    - a. Bond integrity and weathertightness.
    - b. Deterioration of EIFS finishes and other EIFS materials beyond normal weathering.
  2. Warranty coverage includes the following components of EIFS-clad drainage-wall assemblies:
    - a. EIFS finish, including base coats, finish coats, and reinforcing mesh.
    - b. Insulation installed as part of EIFS.
    - c. Insulation adhesive.
    - d. EIFS accessories, including trim components and flashing.
    - e. EIFS drainage components.
  3. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 WATER-DRAINAGE EXTERIOR INSULATION AND FINISH SYSTEM (EIFS)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Dryvit Systems, Inc.
  2. H.B. Fuller Construction Products Inc. / TEC.
  3. Parex USA, Inc.
  4. Sto Corp.

### 2.2 PERFORMANCE REQUIREMENTS

- A. EIFS Performance: Comply with ASTM E2568 and with the following:
1. Weathertightness: Resistant to uncontrolled water penetration from exterior, with a means to drain water entering EIFS to the exterior.
  2. Structural Performance of Assembly and Components:
    - a. Wind Loads: As indicated on Drawing S001.
  3. Impact Performance: ASTM E2568, Medium impact resistance.
  4. Abrasion Resistance of Finish Coat: Sample consisting of 1-inch- thick EIFS mounted on 1/2-inch- thick gypsum board; cured for a minimum of 28 days and shows no cracking, checking, or loss of film integrity after exposure to 528 quarts of sand when tested in accordance with ASTM D968, Method A.

5. Mildew Resistance of Finish Coat: Sample applied to 2-by-2-inch clean glass substrate; cured for 28 days and shows no growth when tested in accordance with ASTM D3273 and evaluated in accordance with ASTM D3274.
6. Drainage Efficiency: 90 percent average minimum when tested in accordance with ASTM E2273.

## 2.3 EIFS MATERIALS

- A. Water-Resistive Barrier Coating: EIFS manufacturer's standard formulation and accessories for use as water-resistive barrier coating; compatible with substrate.
  1. Water-Resistance: Comply with physical and performance criteria of ASTM E2570/E2570M.
- B. Flexible-Membrane Flashing: Cold-applied, self-adhering, self-healing, rubberized-asphalt, and polyethylene-film composite sheet or tape and primer; EIFS manufacturer's standard or product recommended in writing by EIFS manufacturer.
- C. Insulation Adhesive: EIFS manufacturer's standard formulation designed for indicated use; specifically formulated to be applied to back side of insulation in a manner that creates open vertical channels designed to serve as an integral part of the water-drainage system of the EIFS-clad drainage-wall assembly; compatible with substrate; and complying with one of the following:
  1. Job-mixed formulation of portland cement complying with ASTM C150/C150M, Type I, and polymer-based adhesive specified for base coat.
  2. Factory-blended dry formulation of portland cement, dry polymer admixture, and fillers specified for base coat.
  3. Factory-mixed noncementitious formulation designed for adhesive attachment of insulation to substrates of type indicated, as recommended by EIFS manufacturer.
- D. Reinforcing Mesh: Balanced, alkali-resistant, open-weave, glass-fiber mesh treated for compatibility with other EIFS materials, made from continuous multiend strands with retained mesh tensile strength of not less than 120 lbf/in. in accordance with ASTM E2098/E2098M and the following:
  1. Reinforcing Mesh for EIFS, General: Not less than weight required to comply with impact-performance level specified in "Performance Requirements" Article.
- E. Base Coat: EIFS manufacturer's standard mixture complying with one of the following:
  1. Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.
  2. Factory-blended dry formulation of portland cement, dry polymer admixture, and inert fillers to which only water is added at Project site.
  3. Factory-mixed noncementitious formulation of polymer-emulsion adhesive and inert fillers that is ready to use without adding other materials.
- F. Water-Resistant Base Coat: EIFS manufacturer's standard water-resistant formulation complying with the following:
  1. Job-combined formulation of manufacturer's standard polymer-emulsion adhesive and manufacturer's standard dry mix containing portland cement.
- G. Primer: EIFS manufacturer's standard factory-mixed, elastomeric-polymer primer for preparing base-coat surface for application of finish coat.
- H. Finish Coat: EIFS manufacturer's standard acrylic-based coating with enhanced mildew resistance complying with the following:
  1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.
  2. Colors: Match existing.

- 3. Textures: Match existing.
  - I. Sealer: Manufacturer's waterproof, clear acrylic-based sealer for protecting finish coat.
  - J. Water: Potable.
  - K. Trim Accessories: Type as designated or required to suit conditions indicated, matching existing, and to comply with EIFS manufacturer's written instructions; manufactured from UV-stabilized PVC; and complying with ASTM D1784, manufacturer's standard cell class for use intended, and ASTM C1063.
- 2.4 MIXING
- A. Comply with EIFS manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials, except as recommended by EIFS manufacturer. Mix materials in clean containers. Use materials within time period specified by EIFS manufacturer or discard.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where EIFS will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Begin coating application only after surfaces are dry.
  - 2. Application of coating indicates acceptance of surfaces and conditions.

#### **3.2 PREPARATION**

- A. Protect contiguous work from moisture deterioration and soiling caused by application of EIFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect EIFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind drainage plane of EIFS and deterioration of substrates.
- C. Prepare and clean substrates to comply with EIFS manufacturer's written instructions to obtain optimum bond between substrate and adhesive for insulation.
  - 1. Concrete Substrates: Provide clean, dry, neutral-pH substrate for insulation installation. Verify suitability of substrate by performing bond and moisture tests recommended by EIFS manufacturer.

#### **3.3 INSTALLATION OF EIFS, GENERAL**

- A. Comply with ASTM C1397, ASTM E2511, and EIFS manufacturer's written instructions for installation of EIFS as applicable to each type of substrate indicated.

#### **3.4 APPLICATION OF SUBSTRATE PROTECTION**

- A. Water-Resistive Barrier Coating: Coordinate with Section 07 24 19 Contractor.
- B. Flexible-Membrane Flashing: Install over water-resistive barrier coating, applied and lapped to shed water; seal at openings, penetrations, and terminations. Prime substrates with flashing primer if required and install flashing.



### 3.5 INSTALLATION OF TRIM

- A. Trim: Apply trim accessories at perimeter of EIFS, at expansion joints, and elsewhere as indicated. Coordinate with installation of insulation.
1. Weep Screed/Track: Use at bottom termination edges, at window and door heads of water-drainage EIFS unless otherwise indicated.
  2. Windowsill Flashing: Use at windows unless otherwise indicated.
  3. Casing Bead: Use at other locations.

### 3.6 INSTALLATION OF INSULATION

- A. Board Insulation: Adhesively attach insulation to substrate in compliance with ASTM C1397 and the following:
1. Apply adhesive to insulation by notched-trowel method, with notches oriented vertically to produce drainage channels that remain functional after the insulation is adhered to substrate.
  2. Press and slide insulation into place. Apply pressure over entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.
  3. Allow adhered insulation to remain undisturbed for not less than 24 hours, before beginning rasping and sanding insulation or applying base coat and reinforcing mesh.
  4. Abut insulation tightly at joints within and between each course to produce flush, continuously even surfaces without gaps or raised edges between boards. If gaps greater than 1/16 inch occur, fill with insulation cut to fit gaps exactly; insert insulation without using adhesive or other material.
  5. Cut insulation to fit openings, corners, and projections precisely and to produce edges and shapes complying with details indicated.
  6. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/16 inch from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch. Prevent airborne dispersal and immediately collect insulation raspings or sandings.
  7. Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.
  8. Form joints for sealant application with back-to-back casing beads for joints within EIFS and with perimeter casing beads at dissimilar adjoining surfaces. Make gaps between casing beads and between perimeter casing beads and adjoining surfaces of width indicated.
  9. Before installing insulation and before applying field-applied reinforcing mesh, fully wrap board edges. Cover edges of board and extend encapsulating mesh not less than 2-1/2 inches over front and back face unless otherwise indicated on Drawings.
  10. Treat exposed edges of insulation as follows:
    - a. Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.
    - b. Encapsulate edges forming substrates of sealant joints within EIFS or between EIFS and other work with base coat and reinforcing mesh.
    - c. At edges trimmed by accessories, extend base coat, reinforcing mesh, and finish coat over face leg of accessories.
- B. Expansion Joints: Install at locations where required by EIFS manufacturer, and as follows:
1. At expansion joints in substrates behind EIFS.
  2. Where EIFS adjoin dissimilar substrates, materials, and construction, including other EIFS.

### 3.7 APPLICATION OF BASE COAT

- A. Base Coat: Apply full coverage to exposed insulation with not less than 1/16-inch dry-coat thickness.
- B. Reinforcing Mesh: Embed reinforcing mesh in wet base coat to produce wrinkle-free installation with mesh continuous at corners, overlapped not less than 2-1/2 inches or otherwise treated at joints to comply with ASTM C1397. Do not lap reinforcing mesh within 8 inches of corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are invisible.
- C. Additional Reinforcing Mesh: Apply strip-reinforcing mesh around openings, extending 4 inches beyond perimeter. Apply additional 9-by-12-inch strip-reinforcing mesh diagonally at corners of openings (re-entrant corners). Apply 8-inch- wide, strip-reinforcing mesh at both inside and outside corners unless base layer of mesh is lapped not less than 4 inches on each side of corners.

### 3.8 APPLICATION OF FINISH COAT

- A. Primer: Apply over dry base coat.
- B. Finish Coat: Apply full-thickness coverage over dry base coat, maintaining a wet edge at all times for uniform appearance, to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
- C. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by EIFS manufacturer.

### 3.9 CLEANING AND PROTECTION

- A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive EIFS coatings.

END OF SECTION

## **SECTION 07 27 26 - FLUID-APPLIED MEMBRANE AIR BARRIERS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Vapor-retarding, fluid-applied air barriers.
- B. Related Requirements:
  - 1. Section 06 16 00 "Sheathing" for wall sheathings and wall sheathing joint-and-penetration treatments.

#### **1.3 DEFINITIONS**

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate; technical data; dry film thickness; and tested physical and performance properties of products.
- B. Shop Drawings: For air-barrier assemblies.
  - 1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.
  - 2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
  - 3. Include details of interfaces with other materials that form part of air barrier.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
- B. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

1. Include manufacturer's NFPA 285 assembly tests, engineering judgement showing acceptance by Authority Having Jurisdiction, or proof of compliance with 2015 IBC 1403.5, exception 2.

#### 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Build mockups to set quality standards for materials and execution.
  1. Build integrated mockups of exterior wall assembly, incorporating backup wall construction, external cladding, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
    - a. Coordinate construction of mockups to permit inspection and testing of air barrier before external insulation and cladding are installed.
    - b. Include junction with building corner condition, and foundation wall intersection.
    - c. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
  2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
  3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.

#### 1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
  1. Protect substrates from environmental conditions that affect air-barrier performance.
  2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

### **PART 2 - PRODUCTS**

#### 2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.

- C. Fire Propagation Characteristics; Comply with one of the following:
1. Passes NFPA 285 testing as part of an approved assembly.
  2. Has been evaluated by an NFPA certified Fire Engineer who has provided an engineering judgement showing compliance with NFPA 285 and that is acceptable to the authority having jurisdiction.
  3. Complies with 2015 IBC Section 1403.5, exception 2, exhibiting a peak heat release of less than 150kW/m<sup>2</sup>, a total heat release of less than 20 MJ/m<sup>2</sup> and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E 1354, and having a flame spread index of 25 or less, and smoke-developed index of 450 or less as determined by ASTM E84 or UL 723. ASTM E 1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/ m<sup>2</sup>.

## 2.3 HIGH-BUILD AIR BARRIERS, VAPOR RETARDING

- A. High-Build, Vapor-Retarding Air Barrier: Modified bituminous or synthetic polymer membrane with an installed dry film thickness, according to manufacturer's written instructions, of 35 mils or thicker over smooth, void-free substrates.
1. Modified Bituminous Type:
    - a. Products: Subject to compliance with requirements, provide Carlisle Coatings & Waterproofing Inc; Barriseal R or S, or equivalent product by one of the following:
      - 1) Henry Company, Sealants Division.
      - 2) Hohmann & Barnard, Inc.
      - 3) Tremco Incorporated.
      - 4) W.R. Meadows, Inc.
  2. Synthetic Polymer Type:
    - a. Products: Subject to compliance with requirements, provide Carlisle Coatings & Waterproofing Inc; Fire Resist Barritech or equivalent product by one of the following:
      - 1) Grace Construction Products; W.R. Grace & Co. -- Conn..
      - 2) Henry Company.
      - 3) Rubber Polymer Corporation, Inc..
      - 4) W.R. Meadows, Inc.
  3. Physical and Performance Properties:
    - a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
    - b. Vapor Permeance: Maximum 0.1 perm; ASTM E 96/E 96M, Desiccant Method.
    - c. Ultimate Elongation: Minimum 500 percent; ASTM D 412, Die C.
    - d. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D 4541.
    - e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
    - f. UV Resistance: Can be exposed to sunlight for 180 days according to manufacturer's written instructions.

## 2.4 ACCESSORY MATERIALS

- A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
  - 2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
  - 3. Verify that substrates are visibly dry and free of moisture. Test concrete substrates as required for manufacturer.
  - 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.
- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.
- H. Bridge isolation joints, expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

### 3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
  - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
  - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
  - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
  - 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
  - 1. Transition Strip: Roll firmly to enhance adhesion.
- F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- H. Seal top of through-wall flashings to air barrier with an additional 6-inch- wide, transition strip.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

### 3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
  - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
  - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
  - 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.

- B. High-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply air-barrier material in full contact around protrusions such as masonry ties.
  - 1. Vapor-Retarding, High-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 40 mils , applied in one or more equal coats.
- C. Do not cover air barrier until it has been inspected by testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Perform tests and inspections.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections shall include the following:
  - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
  - 2. Air-barrier dry film thickness.
  - 3. Continuous structural support of air-barrier system has been provided.
  - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
  - 5. Site conditions for application temperature and dryness of substrates have been maintained.
  - 6. Surfaces have been primed, if applicable.
  - 7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
  - 8. Termination mastic has been applied on cut edges.
  - 9. Strips and transition strips have been firmly adhered to substrate.
  - 10. Compatible materials have been used.
  - 11. Transitions at changes in direction and structural support at gaps have been provided.
  - 12. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
  - 13. All penetrations have been sealed.
- C. Tests: As determined by testing agency from among the following tests:
  - 1. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.
- D. Air barriers will be considered defective if they do not pass tests and inspections.
  - 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
  - 2. Remove and replace deficient air-barrier components for retesting as specified above.
- E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- F. Prepare test and inspection reports.

### 3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.



1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
  2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION

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## **SECTION 07 42 13.13 - FORMED METAL WALL PANELS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Concealed-fastener, lap-seam metal wall panels.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
  - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
  - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
  - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
  - 6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
  - 7. Review temporary protection requirements for metal panel assembly during and after installation.
  - 8. Review of procedures for repair of metal panels damaged after installation.
  - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
  - 1. Concealed-fastener, lap-seam metal wall panels.
- B. Shop Drawings:
  - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
  - 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:
  - 1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Sample Warranties: For special warranties.

## 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

## 1.7 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

## 1.8 COORDINATION

- A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

## 1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including rupturing, cracking, or puncturing.
    - b. Deterioration of metals and other materials beyond normal weathering.
  - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
  - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
    - b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Finish Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:
  - 1. Wind Loads: As indicated on Drawings.
  - 2. Other Design Loads: As indicated on Drawings.

3. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:
    1. Test-Pressure Difference: 1.57 lbf/sq. ft..
  - C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:
    1. Test-Pressure Difference: 2.86 lbf/sq. ft..
  - D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
    1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
  - E. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.
- 2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS
- A. Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.
  - B. Reveal-Joint, Concealed-Fastener Metal Wall Panels : Formed with vertical panel edges and a flat pan between panel edges; with narrow reveal joint between panels.
    1. Manufacturers: Subject to compliance with requirements, provide Morin, A Kingspan Group Company; Integrity Wall Systems XC-12 or equivalent products by one of the following:
      - a. CENTRIA, a Nucor Brand?.
      - b. Fabral; a brand of OmniMax International.
      - c. Metal Sales Manufacturing Corporation.
    2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
      - a. Nominal Thickness: 22 gage .
      - b. Exterior Finish: Two-coat fluoropolymer.
      - c. Color: As selected by Architect from manufacturer's full range
    3. Panel Coverage: 12 inches.
    4. Panel Height: 7/8 inch.
- 2.3 MISCELLANEOUS MATERIALS
- A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
  - 1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
  - 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
  - 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
  - 4. Attachment Clips: Provide manufacturer's standard clips for concealed panel attachment.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish. Comply with requirements of Section 07 92 00.

#### 2.4 FABRICATION

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
  - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
  - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
  - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
  - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

## 2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Steel Panels and Accessories:
  1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
  1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
  2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
    - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

### 3.3 INSTALLATION OF METAL PANELS

- A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
  1. Shim or otherwise plumb substrates receiving metal panels.

2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
  3. Install screw fasteners in predrilled holes.
  4. Locate and space fastenings in uniform vertical and horizontal alignment.
  5. Install flashing and trim as metal panel work proceeds.
  6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
  7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
  8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
  2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
  3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
  4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
  5. Flash and seal panels with weather closures at perimeter of all openings.
- E. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
- F. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.
1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
  2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).



#### 3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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## **SECTION 07 46 16.13 – EXTRUDED ALUMINUM SIDING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes preformed and prefinished aluminum siding for walls, complete with flashings, corner posts, window and door trim, starter strips, and miscellaneous accessories.

#### **1.3 ALTERNATES**

- A. Work of this Section is affected by Alternates. See Section 01 23 00.

#### **1.4 COORDINATION**

- A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: Submit for each type of product specified. Include identification of materials, dimensions of individual components, installation instructions, available profiles, textures, and colors.
- B. Samples for Verification: Submit two 12-inch lengths for verification of each color, profile, and texture selected.
- C. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Delegated-Design Submittal: For siding indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.7 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced installer who has completed siding installations similar in material, design, and extent to that indicated for project that has resulted in construction with a record of successful in-service performance.

#### **1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to project site in manufacturer's unopened packages or bundles with labels intact.
- B. Store materials in a dry, well-ventilated, weathertight place. Comply with manufacturer's written instructions for storage, handling, and protection.

#### **1.9 FIELD CONDITIONS**

- A. Proceed with Work of this Section after the substrate construction and penetrating work have been completed.

- B. Weather Limitations: Proceed with Work of this Section only if existing and forecasted weather conditions permit siding to be installed to manufacturer's written instructions and if substrate is completely dry.

#### 1.10 WARRANTY

- A. Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair finish or replace siding that show evidence of deterioration of factory-applied finishes. "Deterioration" is defined to include, but is not limited to, checking, crazing, cracking, chipping, mottling, peeling, fading, noticeable color change and other defects.
- B. Finish Warranty Period: 15 years from date of Substantial Completion.

#### 1.11 EXTRA MATERIALS

- A. Provide minimum of 2 percent of installed quantity of each type, color, and texture of siding used in the work. Deliver in unopened clearly labeled bundles to Owner's designated storage space.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Provide siding that complies with performance requirements specified as determined by testing manufacturer's standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. Delegated Design: Design siding, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
  - 1. Structural Performance: Design, engineer, fabricate and install siding to withstand design loads indicated on Drawing S001.
  - 2. Thermal Movements: Provide siding that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.
  - 3. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

#### 2.2 MANUFACTURERS

- A. Source Limitations: Obtain each color, texture, pattern, and type of siding and related accessories from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

#### 2.3 EXTRUDED ALUMINUM SIDING

- A. Extruded Aluminum Siding and Soffits: Longboard Wood Grain Aluminum Siding and Soffits with Alluminate bonded film finish with integrated venting system.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Longboard Architectural Products; Link And Lock Siding or pre-approved equivalent product acceptable to A/E and Owner.
    - a. Dimensions: 1 5/8 inches x 4 inches.
- B. Siding Accessories: Provide matching accessories prefinished to match finish and color of siding.

## 2.4 MISCELLANEOUS MATERIALS

- A. Clips and Fasteners: Manufacturer's standard noncorrosive aluminum clips and fasteners. Provide prefinished fasteners in color matching siding where exposed fasteners are unavoidable.
- B. Sealants:
  - 1. Exposed: Provide Type 1 sealant as specified in Section 07 92 00.

## 2.5 FABRICATION

- A. Fabricate all aluminum trim to profiles shown or required to fit applications indicated and to perform optimally with respect to weather resistance, water tightness, durability, strength, and uniform appearance.

## 2.6 FINISHES

- A. Pretreatment: Manufacturer's standard process.
- B. Wood Grained Powder Coating: Alluminate Premium Wood Finish using a polyurethane powder coat with ink based wood grain patterns sublimated into the base powder effectively tattooing the powder.
  - 1. Color: Light National Walnut.
  - 2. Siding Interior Finish: All concealed from view faces shall receive compatible, non-corrosive material and finish recommended by siding manufacturer.
- C. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that weather barrier underlayment has been installed over sheathing to prevent air infiltration or water penetration. Report to the General Contractor any tears, cuts, unsealed seams, and other deficiencies in the weather barrier underlayment needing repair by the General Contractor.
- C. Examine rough-in for components and systems penetrating siding to verify actual locations of penetrations relative to seam locations of siding before siding installation.
- D. Notify General Contractor of any other conditions detrimental to performance of the Work. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Coordinate installation with flashings and other adjoining construction to ensure proper sequencing.
- C. Prime or finish cut edges and ends of aluminum siding to match balance of siding prior to installation.

### 3.3 INSTALLATION

- A. Comply with siding manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply. Overlap joints to shed water away from direction of prevailing wind.
- B. Aluminum Trim: Provide for thermal expansion of all exposed trim work exceeding 10 ft. running length.
- C. Isolate dissimilar materials by separating from siding with rubber gaskets, elastomeric sealant, or rubber washers where fasteners penetrate siding. Dissimilar metals behind siding shall be isolated from back of siding.
- D. Ensure site cuttings or burred edges do not remain on finish surfaces.
- E. Use concealed fasteners except where approved by A/E.
- F. Apply sealants as indicated or required to resist wind and water penetration. Comply with applicable provisions of Section 07 92 00. Maintain neat appearance.

### 3.4 ADJUSTING AND CLEANING

- A. Remove and replace damaged, improperly installed, or otherwise defective siding and soffit materials with new materials complying with specified requirements.
- B. Clean finished surfaces according to siding manufacturer's written instructions and maintain in a clean condition during construction. Furnish two (2) copies of manufacturer's care and maintenance instructions to Owner.
- C. Remove all debris and excess materials from site. Upon completion of siding work, clean all siding work.

End of Section 07 46 16.13

## **SECTION 07 53 23 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Adhered ethylene-propylene-diene-terpolymer (EPDM) roofing system.
  - 2. Accessory roofing materials.
  - 3. Vapor retarder.
  - 4. Roof insulation.
  - 5. Insulation accessories.
  - 6. Walkways.
- B. Section includes installation of sound-absorbing insulation strips in ribs of roof deck. Sound-absorbing insulation strips are furnished under Section 05 31 00 "Steel Decking."
- C. Related Requirements:
  - 1. Section 06 10 00 "Rough Carpentry for wood nailers, curbs, and blocking and for wood-based, structural-use roof deck panels.
  - 2. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
  - 3. Section 07 62 00 "Sheet Metal Flashing and Trim" for manufactured copings and roof edge flashings.
  - 4. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

#### **1.2 DEFINITIONS**

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
  - 1. Meet with Construction Manager, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment. Notify Owner and Architect of meeting time 7 days ahead of time.
  - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  - 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Examine deck substrate conditions and finishes, including flatness and fastening.
  - 5. Review structural loading limitations of roof deck during and after roofing.
  - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
  - 7. Review governing regulations and requirements for insurance and certificates if applicable.
  - 8. Review temporary protection requirements for roofing system during and after installation.
  - 9. Review roof observation and repair procedures after roofing installation.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.

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1. For insulation and roof system component fasteners, include copy of SPRI's Directory of Roof Assemblies listing.
  - B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
    1. Layout and thickness of insulation.
    2. Base flashings and membrane terminations.
    3. Flashing details at penetrations.
    4. Tapered insulation, thickness, and slopes.
    5. Roof plan showing orientation of steel roof deck and orientation of roof membrane and fastening spacings and patterns for mechanically fastened roofing system.
    6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
    7. Tie-in with air barrier.
  - C. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer and manufacturer.
  - B. Product Test Reports: For components of roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.
  - C. Field quality-control reports.
  - D. Sample Warranties: For manufacturer's special warranties.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For roofing system to include in maintenance manuals.
  - B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.
- 1.7 QUALITY ASSURANCE
- A. Qualifications:
    1. Manufacturers: A qualified manufacturer that is listed in SPRI's Directory of Roof Assemblies for roofing system identical to that used for this Project.
    2. Installers: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
  - B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
    1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
  - C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.



- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

#### 1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

#### 1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
  - 1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, roof pavers, and other components of roofing system.
  - 2. Warranty Period: 20 years from Date of Substantial Completion.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as roof membrane, base flashing, roof insulation, fasteners, and walkway products, for the following warranty period:
  - 1. Warranty Period: Two years from Date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and base flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and flashings to remain watertight.
  - 1. Accelerated Weathering: Roof membrane to withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
  - 2. Impact Resistance: Roof membrane to resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897:
  - 1. Zone 1 (Roof Area Field): 37 lbf/sq. ft..
  - 2. Zone 2 (Roof Area Perimeter): 49 lbf/sq. ft..
    - a. Location: From roof edge to 15 ft. inside roof edge.
  - 3. Zone 3 (Roof Area Corners): 66 lbf/sq. ft..
    - a. Location: 5 ft. in each direction from building corner.
- D. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class B; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

## 2.2 ETHYLENE-PROPYLENE-DIENE-TERPOLYMER (EPDM) ROOFING

- A. EPDM Sheet: ASTM D4637/D4637M, Type I, nonreinforced, EPDM sheet with factory-applied seam tape.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Carlisle SynTec Incorporated.
    - b. Firestone Building Products.
    - c. Johns Manville; a Berkshire Hathaway company.
    - d. Mule-Hide Products Co., Inc.
    - e. Versico Roofing Systems.
  - 2. Thickness: 60 mils, nominal.
  - 3. Exposed Face Color: Black.
  - 4. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturers approved by roof membrane manufacturer.

## 2.3 ACCESSORY ROOFING MATERIALS

- A. General: Accessory materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
  - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: 60-mil- thick EPDM, partially cured or cured, according to application.
- C. Protection Sheet: Epichlorohydrin or neoprene nonreinforced flexible sheet, 55 to 60 mils thick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.
- D. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- E. Bonding Adhesive: Manufacturer's standard, water based if weather conditions permit.
- F. Seaming Material: Factory-applied seam tape, width as recommended by manufacturer.
- G. Lap Sealant: Manufacturer's standard, single-component sealant.
- H. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- I. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- J. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to roofing system manufacturer.
- K. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

## 2.4 VAPOR RETARDER

- A. Rubberized-Asphalt-Sheet Vapor Retarder, Self-Adhering: ASTM D1970/D1970M, polyethylene film laminated to layer of rubberized asphalt adhesive, minimum 40-mil total thickness; maximum permeance rating of 0.1 perm; cold applied, with slip-resisting surface and release paper backing. Provide primer when recommended by vapor retarder manufacturer.

## 2.5 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by EPDM roof membrane manufacturer, approved for use in SPRI's Directory of Roof Assemblies listed roof assemblies.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 2 coated glass-fiber facer on both major surfaces.
  - 1. Thickness: As indicated on Drawings.
- C. Tapered Insulation: Provide factory-tapered insulation boards.
  - 1. Material: Match roof insulation.
  - 2. Minimum Thickness: 1/4 inch.
  - 3. Slope:
    - a. Roof Field: 1/4 inch per foot unless otherwise indicated on Drawings.
    - b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

## 2.6 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
  - 1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
- D. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric; water permeable and resistant to UV degradation; type and weight as recommended by roofing system manufacturer for application.

## 2.7 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system manufacturer.
  - 1. Size: Approximately 36 by 60 inches.
  - 2. Color: Contrasting with roof membrane.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
  - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
  - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05 31 00 "Steel Decking."
  - 4. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.

5. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer when tested according to ASTM F2170.
    - a. Test Frequency: One test probe per each 1000 sq. ft., or portion thereof, of roof deck, with not less than three test probes.
    - b. Submit test reports within 24 hours of performing tests.
  6. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 PREPARATION
- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.
  - B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- 3.3 INSTALLATION OF ROOFING, GENERAL
- A. Install roofing system according to roofing system manufacturer's written instructions, SPRI's Directory of Roof Assemblies assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
  - B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
  - C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.
  - D. Coordinate installation and transition of roofing system component serving as an air barrier with air barrier specified under Section 07 27 26 "Fluid-Applied Membrane Air Barriers."
- 3.4 INSTALLATION OF VAPOR RETARDER
- A. Self-Adhering-Sheet Vapor Retarder for Concrete Substrates: Prime substrate if required by manufacturer. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 and 6 inches, respectively.
    1. Extend vertically up parapet walls and projections to a minimum height equal to height of insulation and cover board.
    2. Seal laps by rolling.
  - B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.
- 3.5 INSTALLATION OF INSULATION
- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
  - B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
  - C. Installation Over Metal Decking:

1. Install base layer of insulation with end joints staggered not less than 12 inches in adjacent rows and with long joints continuous at right angle to flutes of decking.
  - a. Locate end joints over crests of decking.
  - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
  - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
  - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
    - 1) Trim insulation so that water flow is unrestricted.
  - e. Fill gaps exceeding 1/4 inch with insulation.
  - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
  - g. Mechanically attach base layer of insulation using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.
    - 1) Fasten insulation according to requirements in SPRI's Directory of Roof Assemblies for specified Wind Uplift Load Capacity.
    - 2) Fasten insulation to resist specified uplift pressure at corners, perimeter, and field of roof.
2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
  - a. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
  - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
  - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
  - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
  - e. Trim insulation so that water flow is unrestricted.
  - f. Fill gaps exceeding 1/4 inch with insulation.
  - g. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
  - h. Adhere each layer of insulation to substrate using adhesive according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
    - 1) Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

D. Installation Over Concrete Decks:

1. Install base layer of insulation with end joints staggered not less than 12 inches in adjacent rows.
  - a. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
  - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
  - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
  - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
    - 1) Trim insulation so that water flow is unrestricted.
  - e. Fill gaps exceeding 1/4 inch with insulation.
  - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

- g. Adhere base layer of insulation to vapor retarder according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
  - 1) Set insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
- 2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.
  - a. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
  - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
  - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
  - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
    - 1) Trim insulation so that water is unrestricted.
  - e. Fill gaps exceeding 1/4 inch with insulation.
  - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
  - g. Adhere each layer of insulation to substrate using adhesive according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
    - 1) Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

### 3.6 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll membrane roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- F. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeters.
- G. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- H. Factory-Applied Seam Tape Installation: Clean and prime surface to receive tape.
  - 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
  - 2. Apply lap sealant and seal exposed edges of roofing terminations.
- I. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.
- J. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.
- K. Adhere protection sheet over roof membrane at locations indicated.

### 3.7 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

### 3.8 INSTALLATION OF WALKWAYS

- A. Flexible Walkways: Install walkway products according to manufacturer's written instructions.
  - 1. Install flexible walkways at the following locations:
    - a. Perimeter of each rooftop unit.
    - b. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
    - c. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.
    - d. Locations indicated on Drawings.
    - e. As required by roof membrane manufacturer's warranty requirements.
  - 2. Provide 6-inch clearance between adjoining pads.
  - 3. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

### 3.9 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
- B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

### 3.10 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

### 3.11 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS \_\_\_\_\_ of \_\_\_\_\_, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
1. Owner: Jefferson County.
  2. Building Name/Type: Jefferson County Courthouse and Sheriff Building.
  3. Building Address: 311 S Center Ave., Jefferson, WI 53549.
  4. Area of Work: Additions.
  5. Acceptance Date: \_\_\_\_\_.
  6. Warranty Period: Two (2) Years.
  7. Expiration Date: \_\_\_\_\_.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
    - a. lightning;
    - b. peak gust wind speed exceeding 120 mph;
    - c. fire;
    - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
    - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
    - f. vapor condensation on bottom of roofing; and
    - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
  2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
  3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
  4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.



5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

1. Authorized Signature: \_\_\_\_\_.
2. Name: \_\_\_\_\_.
3. Title: \_\_\_\_\_.

END OF SECTION

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## SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Roof-drainage sheet metal fabrications.
2. Low-slope roof sheet metal fabrications.
3. Wall sheet metal fabrications.
4. Miscellaneous sheet metal fabrications.

##### B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 04 20 00 "Unit Masonry" for installation of manufactured sheet metal through-wall flashing and trim integral with masonry.
3. Section 07 53 23 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing" for installation of sheet metal flashing and trim integral with roofing.
4. Section 07 95 13.13 "Interior Expansion Joint Cover Assemblies" for manufactured expansion-joint cover assemblies for interior floors, walls, and ceilings.
5. Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" for manufactured expansion-joint cover assemblies for exterior building walls, soffits, and parapets.

#### 1.2 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

#### 1.3 PREINSTALLATION MEETINGS

##### A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

#### 1.4 ACTION SUBMITTALS

##### A. Product Data: For each of the following

1. Butyl sealant.
2. Roof edge flashings and copings.

##### B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.

6. Include details of termination points and assemblies.
  7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
  8. Include details of roof-penetration flashing.
  9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
  10. Include details of special conditions.
  11. Include details of connections to adjoining work.
- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
  - B. Sample Warranty: For special warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.
  - B. Special warranty.
- 1.7 QUALITY ASSURANCE
- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
    1. Build mockup as described in Section 04 20 00 and as detailed in Drawings.
    2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations in writing.
    3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
    1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
    2. Protect stored sheet metal flashing and trim from contact with water.
  - B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.
- 1.9 WARRANTY
- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
    1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
      - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
      - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:
  1. Design Pressure: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

### **2.2 SHEET METALS**

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
  1. Exposed Coil-Coated Finish:
    - a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.
  1. Finish: ASTM A480/A480M, No. 4 (polished directional satin).
    - a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
    - b. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
      - 1) Run grain of directional finishes with long dimension of each piece.
      - 2) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

- D. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet in accordance with ASTM A653/A653M, G90 coating designation or aluminum-zinc alloy-coated steel sheet in accordance with ASTM A792/A792M, Class AZ50 coating designation, Grade 40; prepainted by coil-coating process to comply with ASTM A755/A755M.
1. Surface: Smooth, flat.
  2. Exposed Coil-Coated Finish:
    - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  3. Color: As selected by Architect from manufacturer's full range.
  4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

## 2.3 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
    - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    - b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
  2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: Comply with requirements in Section 07 92 00.
- E. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- G. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.
- H. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Fry Reglet Corporation.

- b. Heckmann Building Products, Inc.
  - c. Hohmann & Barnard, Inc.
  - d. Metal-Era, Inc.
- 2. Source Limitations: Obtain reglets from single source from single manufacturer.
  - 3. Material: Galvanized steel, 0.022 inch thick.
  - 4. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
  - 5. Masonry Type: Provide with offset top flange for embedment in masonry mortar joint.

#### 2.4 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
  - 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
  - 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
  - 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
  - 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
  - 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:
  - 1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
  - 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
  - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
  - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams:
  - 1. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

#### 2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fabricate from the following materials:

1. Galvanized Steel: 24 gage.

## 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long sections. Furnish with 6-inch- wide, joint cover plates. Shop fabricate interior and exterior corners.
  1. Joint Style: Butted with expansion space and 6-inch- wide, concealed backup plate.
  2. Fabricate scuppers to dimensions required with 4-inch- wide flanges and base extending 4 inches beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.
  3. Fabricate from the following materials:
    - a. Galvanized Steel: 24 gage.
- B. Copings: Fabricate in minimum 96-inch- long, but not exceeding 12-foot- long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, fasten and seal watertight. Shop fabricate interior and exterior corners.
  1. Joint Style: Butted with expansion space and 6-inch- wide, concealed backup plate.
  2. Fabricate from the following materials:
    - a. Galvanized Steel: 20 gage.
- C. Rigid Aluminum Sills: Fabricate from the following materials:
  1. Aluminum: .090 inch.
- D. Base Flashing: Fabricate from the following materials:
  1. Stainless Steel: 26 gage.
- E. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
  1. Galvanized Steel: 24 gage.
- F. Flashing Receivers: Fabricate from the following materials:
  1. Galvanized Steel: 24 gage.
- G. Roof-Penetration Flashing: Fabricate from the following materials:
  1. Galvanized Steel: 22 gage.

## 2.7 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot- long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch- high, end dams. Fabricate from the following materials:
  1. Galvanized Steel: 24 gage.
- B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend beyond wall openings as indicated in drawings. Form head and sill flashing with 2-inch-high, end dams. Fabricate from the following materials:
  1. Galvanized Steel: 24 gage.

## 2.8 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:
  1. Galvanized Steel: 22 gage.



## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
  - 1. Verify compliance with requirements for installation tolerances of substrates.
  - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION, GENERAL**

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
  - 1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
  - 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of sealant.
  - 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
  - 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
  - 5. Space individual cleats not more than 12 inches apart or as required by tested assembly. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  - 6. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
  - 7. Do not field cut sheet metal flashing and trim by torch.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
  - 1. Coat concealed side of stainless steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
  - 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
  - 1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
  - 2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
  - 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
  - 1. Use sealant-filled joints unless otherwise indicated.
    - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
    - b. Form joints to completely conceal sealant.
    - c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
    - d. Adjust setting proportionately for installation at higher ambient temperatures.
      - 1) Do not install sealant-type joints at temperatures below 40 deg F.
  - 2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."

### 3.3 INSTALLATION OF ROOF-DRAINAGE SYSTEM

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Parapet Scuppers:
  - 1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
  - 2. Anchor scupper closure trim flange to exterior wall and seal with elastomeric sealant to scupper.

### 3.4 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.
  - 1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
  - 2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing:
  - 1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
  - 2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
  - 3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- C. Copings:
  - 1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.
  - 1. Insert counterflashing in reglets or receivers and fit tightly to base flashing.
  - 2. Extend counterflashing 4 inches over base flashing.
  - 3. Lap counterflashing joints minimum of 4 inches.

- 4. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.
  - F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with butyl sealant and clamp flashing to pipes that penetrate roof.
- 3.5 INSTALLATION OF WALL FLASHINGS
- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
  - B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend beyond wall openings as shown in drawings.
  - C. Reglets: Installation of reglets is specified in Section 04 20 00 "Unit Masonry."
- 3.6 INSTALLATION OF MISCELLANEOUS FLASHING
- A. Equipment Support Flashing:
    - 1. Coordinate installation of equipment support flashing with installation of roofing and equipment.
    - 2. Weld or seal flashing with elastomeric sealant to equipment support member.
- 3.7 INSTALLATION TOLERANCES
- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- 3.8 CLEANING
- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
  - B. Clean off excess sealants.
- 3.9 PROTECTION
- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
  - B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
  - C. Maintain sheet metal flashing and trim in clean condition during construction.
  - D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION

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## **SECTION 07 65 00 - FLEXIBLE FLASHING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Flexible Flashings, other than roof flashings.
  - 2. Accessory flashing supports.
- B. Related Requirements:
  - 1. Section 07 27 26 "Fluid Applied Membrane Air Barriers" for coordination with air barrier installation.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: Submit two copies of manufacturer's technical product data, installation instructions and general recommendation for prefabricated and prefinished products required. Include data substantiating that materials and performance comply with requirements.
- B. Shop Drawings: Include details showing support of flexible flashings at through wall and other spanning condition, attachments to adjacent work, and integration with air barrier.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Preconstruction Field-Adhesion-Test Reports: Indicate which surface preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

#### **1.5 QUALITY ASSURANCE**

- A. Preconstruction Field-Adhesion Testing: Before installing flexible flashing, field test their adhesion to Project joint substrates as follows:
  - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
  - 2. Conduct field tests for each kind of flashing adhesive and joint substrate.
  - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

#### **1.6 FIELD CONDITIONS**

- A. Coordinate work of this Section with adjoining work for proper sequencing of each installation to ensure best possible weather resistance and protection of materials and finishes against damage.
- B. Install flexible flashings within weather conditions approved by the manufacturer.

## **PART 2 - PRODUCTS**

### **2.1 FLEXIBLE FLASHING**

- A. Stainless Steel-Laminated Flashing: Self-adhering, dead-soft stainless steel sheet composite with non-asphalt adhesive polymer fabric laminated to one side. For use at miscellaneous transitions, sills, opening perimeters, and lap tape for through wall flashings.
  - 1. Manufacturers: Subject to compliance with requirements, provide York Manufacturing, Inc.; York 304 or equivalent products by one of the following:
    - a. Hohmann & Barnard, Inc.
    - b. Wire-Bond.
- B. Venting Stainless Steel-Laminated Flashing: Self-adhering, dead-soft stainless steel sheet composite with non-asphalt adhesive polymer fabric laminated to one side and non-woven drainage fabric laminated to opposing face with non-asphalt adhesive. For use as through-wall flashing where flashing is fully concealed in wall cavity.
  - 1. Manufacturers: Subject to compliance with requirements, provide York Manufacturing, Inc.; York Flash-Vent SA or equivalent products by one of the following:
    - a. Hohmann & Barnard, Inc.
    - b. Wire-Bond.
- C. Physical Properties:
  - 1. Tensile Strength: 100,000 psi per ASTM D882
  - 2. Puncture Resistance: 2,500 psi per ASTM E154
  - 3. Adhesion: 20 psi per PSTC-1
  - 4. Fire Resistance: Class A per ASTM E84.
  - 5. Mold Resistance: Pass ASTM D3273
- D. Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

## **PART 3 - EXECUTION**

### **3.1 COORDINATION**

- A. Coordinate the Work of this Section with contractors responsible for adjacent work.

### **3.2 PREPARATION**

- A. Assure that substrate is sound and adequate to receive flashing materials.
- B. Surface conditioner is required for dirty or dusty surfaces or surfaces having irregular or rough texture.
- C. When required apply surface conditioner by spray, brush or roller at the rate recommended by manufacturer.
  - 1. Allow surface conditioner to dry completely before flashing application. The surface conditioner is considered dry when the substrate returns to its original color (minimum 1 hour). To test for dryness, rub small conditioned area by hand. Wet conditioner will ball up under the fingertips. Let dry until conditioner cannot be rubbed off.
  - 2. If conditioned areas are not covered that day, recondition area if there is significant dust or dirt contamination.

### **3.3 INSTALLATION**

- A. Stainless Steel Flashings: Install where indicated, specified, or required in accord with flashing manufacturer's written instructions and as follows.

1. Extend flashing 6" minimum beyond opening. Fold flashing ends at end of openings or horizontal flashing terminations to form end dam or use pre-manufactured units made of 26 gauge stainless steel.
  2. Flashing width: Width required starting flush with outside face of exterior wythe, extending through cavity, rising height required to extend above lintel steel at least 2".
  3. Splice end joints by overlapping them 6 inches and seal with a compatible sealant or metal splice tape.
  4. Masonry back up:
    - a. Surface apply after dampproofing installation specified in Dampproofing Section in accord with manufacturer's installation instructions.
    - b. Fasten the top of the flashings to the back up wall with a non-corrosive termination bar and seal the top edge with a compatible sealant or use a termination clamp, which is embedded in the block back up wall.
  5. Concrete back up:
    - a. Surface apply after dampproofing installation specified in Dampproofing Section in accord with manufacturer's installation instructions.
    - b. Fasten the top of the flashings to the back up wall with a non-corrosive termination bar and seal the top edge with a compatible sealant..
  6. Stud back up with sheathing:
    - a. Fasten the top of the flashings to the back up wall with a non-corrosive termination bar and seal the top edge with a compatible sealant.
  7. Leave ready for certified compatible building felt or air barrier installation lapping flashing top installed in another Section.
  8. Lay flashing in continuous bead of sealant on masonry supporting steel.
  9. Fold ends of flashing at end of opening to form dam; seal with polyether sealant or use purchased manufacturer's preformed end dams.
  10. Inside and outside corners: Make in industry accepted manner using corner and splice material or purchase manufactured corners from manufacturer.
- B. Flashing Supports: Break sheet metal to profile indicated or required and fasten to substrate to support flexible flashing across cavity.
- 3.4 PROTECTION
- A. Protect flashing from damage during construction.
  - B. Repair damaged flashing per manufacturer's instructions.

End of Section 07 65 00

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## **SECTION 07 71 29 - MANUFACTURED ROOF EXPANSION JOINTS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

##### **A. Section Includes:**

1. Flanged bellows-type roof expansion joints.

##### **B. Related Requirements:**

1. Section 06 10 00 "Rough Carpentry" for wooden curbs or cants for mounting roof expansion joints.
2. Section 07 62 00 "Sheet Metal Flashing and Trim" for shop- and field-fabricated sheet metal expansion-joint systems, flashing, and other sheet metal items.
3. Section 07 72 00 "Roof Accessories" for manufactured and prefabricated metal roof curbs.

#### **1.2 ACTION SUBMITTALS**

##### **A. Product Data:**

1. Flanged bellows-type roof expansion joints.

##### **B. Shop Drawings: For roof expansion joints.**

1. Include plans, elevations, sections, and attachment details.
2. Include details of splices, intersections, transitions, fittings, method of field assembly, and location and size of each field splice.
3. Provide isometric drawings of intersections, terminations, changes in joint direction or planes, and transition to other expansion joint systems depicting how components interconnect with each other and adjacent construction to allow movement and achieve waterproof continuity.

#### **1.3 INFORMATIONAL SUBMITTALS**

##### **A. Product Test Reports: For each fire-barrier provided as part of a roof-expansion-joint assembly, for tests performed by a qualified testing agency.**

##### **B. Sample Warranties: For special warranties.**

#### **1.4 QUALITY ASSURANCE**

##### **A. Installer Qualifications: Installer of roofing membrane.**

#### **1.5 WARRANTY**

##### **A. Special Warranty: Manufacturer and Installer agree to repair or replace roof expansion joints and components that leak, deteriorate beyond normal weathering, or otherwise fail in materials or workmanship within specified warranty period.**

1. Warranty Period: Two years from date of Substantial Completion.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

##### **A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint seals, failure of connections, and other detrimental effects.**

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## 2.2 FLANGED BELLOWS-TYPE ROOF EXPANSION JOINTS

- A. Flanged Bellows-Type Roof Expansion Joint : Factory-fabricated, continuous, waterproof, joint cover consisting of exposed membrane bellows laminated to flexible, closed-cell support foam, and secured along each edge to 3- to 4-inch- wide metal flange.
  1. Manufacturers: Subject to compliance with requirements, provide Nystrom, Inc.; ECF Series expansion joint or equivalent products by one of the following:
    - a. Balco; a CSW Industrials Company.
    - b. Construction Specialties, Inc.
    - c. Johns Manville; a Berkshire Hathaway company.
    - d. MM Systems Corporation.
    - e. inpro Corporation.
  2. Source Limitations: Obtain flanged bellows-type roof expansion joints approved by roofing manufacturer and that are part of roofing membrane warranty.
  3. Joint Movement Capability: Plus and minus 50 percent of joint size.
  4. Bellows: EPDM flexible membrane, nominal 60 mils thick.
  5. Flanges: Galvanized steel, 0.022 inch thick.
  6. Configuration: Angle formed to fit curbs as indicated on Drawings.
  7. Corner, Intersection, and Transition Units: Provide factory-fabricated units for corner and joint intersections and horizontal and vertical transitions including those to other building expansion joints.
  8. Cover Membrane: EPDM flexible membrane, factory laminated to bellows and covering entire joint assembly and curbs.
    - a. Color: Black.
  9. Accessories: Provide splicing units, adhesives, and other components as recommended by roof-expansion-joint manufacturer for complete installation.
  10. Secondary Seal: Continuous, waterproof membrane within joint and attached to substrate on sides of joint below the primary bellows assembly.
    - a. Thermal Insulation: Fill space above secondary seal with manufacturer's standard, factory-installed mineral-fiber insulation; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E84.
- B. Materials:
  1. Galvanized-Steel Sheet: ASTM A653/A653M, hot-dip zinc-coating designation G90.
  2. EPDM Membrane: ASTM D4637/D4637M, type standard with manufacturer for application.

## 2.3 MISCELLANEOUS MATERIALS

- A. Adhesives: As recommended by roof-expansion-joint manufacturer.
- B. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to withstand design loads.
  1. Exposed Fasteners: Gasketed. Use screws with hex washer heads matching color of material being fastened.
- C. Mineral-Fiber Blanket: ASTM C665.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine joint openings, substrates, and expansion-control joint systems that interface with roof expansion joints, for suitable conditions where roof expansion joints will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION, GENERAL**

- A. Comply with manufacturer's written instructions for handling and installing roof expansion joints.
  - 1. Anchor roof expansion joints securely in place, with provisions for required movement. Use fasteners, protective coatings, sealants, and miscellaneous items as required to complete roof expansion joints.
  - 2. Install roof expansion joints true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
  - 3. Provide for linear thermal expansion of roof-expansion-joint materials.
  - 4. Provide uniform profile of roof expansion joint throughout its length; do not stretch or squeeze membranes.
  - 5. Provide uniform, neat seams.
  - 6. Install roof expansion joints to fit substrates and to result in watertight performance.
- B. Directional Changes: Install factory-fabricated units at directional changes to provide continuous, uninterrupted, and watertight joints.
- C. Transitions to Other Expansion-Control Joint Assemblies: Coordinate installation of roof expansion joints with other exterior expansion-control joint assemblies specified in Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" to result in watertight performance.
- D. Splices: Splice roof expansion joints to provide continuous, uninterrupted, and waterproof joints.
  - 1. Install waterproof splices and prefabricated end dams to prevent leakage of secondary-seal membrane.
- E. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

END OF SECTION

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## SECTION 07 72 73 - VEGETATED ROOF SYSTEMS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Tray-type vegetated roof assembly.
  - 2. Geofoam fill.
- B. Related Requirements:
  - 1. Refer to Section 01 23 00 "Alternates" for work of this section affected by alternate pricing.
  - 2. Section 07 53 23 "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing" for roofing membrane, roof thermal insulation, and roofing system warranty.

#### 1.2 DEFINITIONS

- A. Captured Water: Water that is retained in the drainage layer of a vegetated roof assembly after new water additions have ceased and that cannot escape the roof except through evaporation or plant transpiration.
- B. Finish Elevation: Elevation of finished growing-media surface of planting area.
- C. Growing Medium: Manufactured, lightweight soil mixture that promotes good growing conditions for specific varieties of plants.
- D. Plant; Plants; Plant Material: Vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

#### 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each vegetated roof assembly.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
  - 2. Include material descriptions for each growing medium.
- B. Shop Drawings: For each vegetated roof assembly.
  - 1. Include plans, sections, slopes, and drain locations.
  - 2. Indicate dimensions, weights, and loads.
  - 3. Detail field assembly of components, depth of growing media, and attachments to other work.
- C. Samples for Verification: For each of the following components of vegetated roof assembly:
  - 1. Preplanted Vegetative Mat: 12 by 12 inches.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of manufactured product.
  - 1. Manufacturer's certified analysis of standard products.
  - 2. Analysis of other materials by a recognized laboratory, in accordance with methods established by the Association of Official Analytical Chemists, where applicable.

- C. Product Test Reports: For complete analysis of each growing medium, for tests performed by manufacturer and witnessed by a qualified testing agency or by a qualified testing agency.
  - D. Sample Warranty: For special warranties.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For vegetated roof assembly and plants, including a recommended maintenance plan with procedures for inspection and care during a calendar year. Submit before start of required warranty and maintenance periods.
- 1.7 QUALITY ASSURANCE
- A. Installer Qualifications: A qualified vegetated roof assembly Installer, approved, authorized, or licensed by roofing-membrane manufacturer, whose work has resulted in successful establishment of vegetated roofs.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and Federal laws if applicable.
  - B. Bulk Materials:
    - 1. Do not dump or store bulk materials on or near structures, utilities, walkways and pavements, or existing roof areas or plants.
    - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of debris-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
    - 3. Accompany each delivery of bulk materials with product certificates.
  - C. Handle and store materials, and place equipment in a manner to avoid overloading roof structure or damaging roofing membrane.
- 1.9 FIELD CONDITIONS
- A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when optimum results may be obtained. Apply products during favorable weather conditions in accordance with manufacturer's written instructions and warranty requirements.
- 1.10 WARRANTY
- A. Special Warranty for Vegetated Roof Assembly: Installer agrees to repair or replace components of vegetated roof assembly that fail in materials or workmanship within specified warranty period.
    - 1. Failures include, but are not limited to, ponding water or prolonged wetness of growing medium caused as a result of failure of the assembly to properly drain.
    - 2. Warranty Period: Five years from date of Substantial Completion.
  - B. Special Warranty for Plant Growth: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
    - 1. Foliage Cover: Planted materials to grow to achieve and maintain at least 80 percent foliage cover over planting area commencing 24 months after planting, through the duration of this warranty.
    - 2. Failures include, but are not limited to, death and unsatisfactory growth except for defects resulting from abuse, lack of adequate maintenance, neglect by Owner, or incidents that are beyond Contractor's control.

3. Warranty Period: From date of Substantial Completion as follows:
  - a. Ground Covers, Perennials, Vines, and Ornamental Grasses: Five years.
4. Include the following remedial actions as a minimum:
  - a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
  - b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
  - c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
5. Provide extended warranty for period equal to original warranty period, for replaced plant material.

## **PART 2 - PRODUCTS**

### **2.1 SOURCE LIMITATIONS**

- A. Obtain vegetated roof assembly components, growing medium and accessories from single source from single manufacturer.

### **2.2 VEGETATED ROOF ASSEMBLIES**

- A. Tray-Type Vegetated Roof Assembly : Modular assembly consisting of manufacturer's standard, preplanted trays for field assembly adjacent to and interlocking with each other over roofing system.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Carlisle Syntec Systems.
    - b. Firestone Building Products.
    - c. GreenGrid Roofs; Weston Solutions, Inc.
    - d. GreenTech, Inc.
    - e. LiveRoof, LLC
    - f. Soprema, Inc.
  2. Tray Depth, Nominal: 4 inches.
  3. Tray Size: Manufacturer's standard.
  4. Assembly Weight: Maximum 15 lb/sq. ft., including growing medium and plants and saturated with captured water, but not including weight of roofing system.
  5. Plantings: Sedum as selected by Architect from manufacturer's standard varieties.

### **2.3 VEGETATED ROOF ASSEMBLY COMPONENTS**

- A. Drainage Panels: Assembly manufacturer's standard drainage board formed from geotextile-faced, molded-plastic sheet with a geotextile face and "cups" of the molded sheet facing upward like small reservoirs to retain water while allowing excess water to drain away below the board.
- B. Root Barrier: If required by Manufacturer's system, provide vegetated roof assembly manufacturer's standard plastic sheet manufactured from recycled polyethylene or polypropylene plastic; formulated to resist root growth and bacteria.

### **2.4 MANUFACTURED GROWING MEDIA**

- A. Growing Medium: Vegetated roof assembly manufacturer's lightweight, manufactured soil mixture designed for plantings noted above.

1. General Condition at Time of Planting: Free of aggregates 1/2 inch or larger in any dimension; free of roots, plants, clods, pockets of sand, paint, building debris, oils, solvents, roofing materials, and other extraneous materials harmful to plant growth; free of weeds, disease-causing plant pathogens, and other undesirable organisms.
2. Maximum Media Density: ASTM E2399, 60 lb/cu. ft. for basic growing-medium mixture.
3. Maximum Media Water Retention: ASTM E2399, 48 percent by volume for basic growing-medium mixture at maximum media density.
4. Water Permeability: ASTM E2399, .434 in/min. for basic growing-medium mixture at maximum media density.

## 2.5 GEOFOAM FILL

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. DiversiFoam Products.
  2. Insulfoam; Carlisle Construction Materials Company.
  3. Owens Corning.
  4. The Dow Chemical Company.
- B. Rigid Cellular Polystyrene Geofoam: ASTM D6817, Type EPS 39, 2.40-lb/cu. ft. density, 15-psi compressive strength at 1 percent deformation; 40-psi compressive strength at 10 percent deformation.

## 2.6 ACCESSORIES

- A. Access Boxes: Manufacturer's standard stainless steel, plastic, or aluminum boxes with removable, rigid covers for accessing drains, valves, and switches beneath the finish elevation of growing medium; secure each cover with four noncorrosive screws.
  1. Size: 12 inches square by depth of vegetated roof assembly at each location.
    - a.
- B. Soil Retainer: Precast concrete curbs configured as indicated in drawings, with drainage openings.
  1. Lightweight Concrete Backup Mixtures: Proportion mixtures by either laboratory trial batch or field test data methods according to ACI 211.2, with materials to be used on Project, to provide lightweight concrete with the following properties:
    - a. Compressive Strength (28 Days): 5000 psi (34.5 MPa).
    - b. Unit Weight: Calculated equilibrium unit weight of 115 lb/cu. ft. (1842 kg/cu. m), plus or minus 3 lb/cu. ft. (48 kg/cu. m), according to ASTM C567.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine each area to receive vegetated roof assembly for compliance with requirements for installation tolerances and other conditions affecting performance.
  1. Verify that roof insulation over roofing membrane is in place, secure, and flush along all seams.
  2. Verify that perimeter and other flashings are in place and secure along entire lengths where they will be covered by vegetated roof assembly.
- B. Inspect growing medium.



1. Verify that no foreign or deleterious material or liquid, such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in growing medium within a planting area.
2. If growing medium is contaminated by foreign or deleterious material or liquid, remove growing medium and contamination and replace with new growing medium.

### 3.2 INSTALLATION, GENERAL

- A. Protection Course: Cover roofing system with protection board with butted and fully taped joints before roofing system is subject to vegetated roof assembly installation work.
- B. Install vegetated roof assembly in accordance with manufacturer's written instructions.
- C. Geofoam Fill: Install geofoam-fill blocks in as few layers as possible with abutting edges and ends and with the long dimension of each block placed at right angles to blocks in each subsequent layer. Offset joints of blocks in successive layers.
  1. Cover geofoam fill with separation geotextile before placing overlying growing medium.
- D. Access Boxes: Install access box at each drain, valve, and switch. Install top of boxes 1 inch above the finish elevation of growing medium.

### 3.3 PLANTING

- A. Perform planting in accordance with vegetated roof assembly manufacturer's written instructions.
- B. Do not place growing medium or plants during frozen, wet, or muddy conditions.

### 3.4 INSTALLATION OF SOIL RETAINER

- A. Install soil retainer where indicated in accordance with manufacturer's written instructions.

### 3.5 PROTECTION

- A. Protect vegetated roof assemblies from damage, including growing-medium contamination, due to operations of other contractors and trades. Repair or replace damaged vegetated roof assemblies.

END OF SECTION

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## **SECTION 07 76 00 - ROOF PAVERS**

### **PART 1 - GENERAL**

#### **1.1 DESCRIPTION**

- A. Roof pavers and paver pedestal system at locations indicated on the Drawings.

#### **1.2 RELATED WORK AND REQUIREMENTS**

- A. Applicable provisions of Division 01 shall govern Work of this Section
- B. Refer to Section 01 23 00 "Alternates" for work of this section affected by alternate pricing.
- C. Section 07 53 00: Elastomeric Membrane Roofing
- D. Section 07 71 00: Roof Specialties

#### **1.3 SUBMITTALS**

- A. Submit shop drawings and product data for all products.
- B. Submit samples of the pedestal system.

#### **1.4 QUALITY ASSURANCE**

- A. The paver contractor shall have a minimum of 5 years experience specializing in the installation of paver materials.
- B. All components in the paver system shall be approved by the manufacturer.

### **PART 2 - PRODUCTS**

#### **2.1 ROOF PAVERS**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Wausau Tile, Inc.; H-Series Estate pavers or equivalent product by, but not limited to, one of the following:
  - 1. Hanover Architectural Products
  - 2. Stepstone, Inc.
  - 3. Westile Roofing Products
- B. Properties:
  - 1. Size: 24 inches x 24 inches x 2 inches nominal.
  - 2. Weight: 24-33 lbs/sf.
  - 3. Compressive Strength: Minimum 8,000 psi, average, per ASTM C 140.
  - 4. Water Absorption: Less than 5 percent per ASTM C 140.
- C. Pavers shall also conform to the following ASTM specifications:
  - 1. ASTM C 150: Specifications for Portland Cement.
  - 2. ASTM C 33: Specifications for normal weight aggregate.
  - 3. ASTM C 67: Section 8 Freeze/Thaw Specifications: No breakage and not greater than 1 percent loss in dry weight of any individual unit when subjected to 50 cycles.
- D. Center Load: Individual paver shall support a concentrated load of 1,850 lbs. when supported on four corners.
- E. Colors: Custom color blend to be chosen from manufacturer's standard range.

2.2 PAVER PEDESTAL SYSTEM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Wausau Tile, Inc.; Terra System One or equivalent product by, but not limited to, one of the following:
  - 1. Hanover Architectural Products
  - 2. Stepstone, Inc.
  - 3. Westile Roofing Products
- B. Weatherability: Unaffected by freeze-thaw cycling, ozone, humidity and is not water absorbent.

**PART 3 - EXECUTION**

3.1 INSTALLATION

- A. Install pavers and paver pedestal system in accordance with manufacturer's printed installation instructions.
- B. Contractor shall coordinate its work with the work of the Roofing Contractor.
- C. Shim pedestals utilizing manufacturer's standard shims to create a level paver surface.

End of Section 07 76 00

## **SECTION 07 81 00 - APPLIED FIRE PROTECTION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Sprayed fire-resistive materials.
- B. Related Requirements:
  - 1. Section 07 81 23 "Intumescent Fire Protection" for mastic and intumescent fire-resistive coatings.

#### **1.3 DEFINITIONS**

- A. SFRM: Sprayed fire-resistive materials.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review products, design ratings, restrained and unrestrained conditions, densities, thicknesses, bond strengths, and other performance requirements.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Sprayed fire-resistive material.
  - 2. Substrate primers.
  - 3. Bonding agent.
- B. Shop Drawings: Framing plans or schedules, or both, indicating the following:
  - 1. Extent of fire protection for each construction and fire-resistance rating.
  - 2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
  - 3. Minimum sprayed fire-resistive material thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
  - 4. Treatment of sprayed fire-resistive material after application.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of sprayed fire-resistive material.
- C. Evaluation Reports: For sprayed fire-resistive material, from ICC-ES.

#### **1.7 QUALITY ASSURANCE**

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by sprayed fire-resistive material manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

## 1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fire protection when ambient or substrate temperature is 44 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fire protection, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fire protection dries thoroughly.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fire protection, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fire protection for each fire-resistance design from single source.
- C. Fire-Resistance Design: Tested according to ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. Asbestos: Provide products containing no detectable asbestos.

### 2.2 SPRAYED FIRE-RESISTIVE MATERIALS

- A. Sprayed Fire-Resistive Material: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application or conveyed in a dry state and mixed with atomized water at place of application.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Carboline Company; a subsidiary of RPM International.
    - b. GCP Applied Technologies Inc.
    - c. Isolatek International.
    - d. Pyrok, Inc.
    - e. Schundler Company (The).
    - f. Southwest Fireproofing Products Co.
  - 2. Bond Strength: Minimum 430-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E736.
  - 3. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E605.
  - 4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E605, whichever is thicker, but not less than 0.375 inch.
  - 5. Combustion Characteristics: ASTM E136.
  - 6. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: 10 or less.
    - b. Smoke-Developed Index: 0.
  - 7. Compressive Strength: Minimum 10 lbf/sq. in. according to ASTM E761.
  - 8. Corrosion Resistance: No evidence of corrosion according to ASTM E937.
  - 9. Deflection: No cracking, spalling, or delamination according to ASTM E759.
  - 10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E760.

11. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E859.
12. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G21 or rating of 10 according to ASTM D3274 when tested according to ASTM D3273.

### 2.3 AUXILIARY MATERIALS

- A. Provide auxiliary materials that are compatible with sprayed fire-resistive material and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: If required, primers approved by sprayed fire-resistive material manufacturer and complying with one or both of the following requirements:
  1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  2. Primer's bond strength in required fire-resistance design complies with specified bond strength for sprayed fire-resistive material and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E736.
- C. Bonding Agent: If required, product approved by sprayed fire-resistive material manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
  1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fire protection with substrates under conditions of normal use or fire exposure.
  2. Verify that objects penetrating fire protection, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
  3. Verify that substrates receiving fire protection are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fire protection application.
- B. Verify that roof construction, installation of rooftop HVAC equipment, and other related work are complete before beginning Work.
- C. Conduct tests according to sprayed fire-resistive material manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fire protection materials during application.
- B. Clean substrates of substances that could impair bond of fire protection.

- C. Prime substrates where included in fire-resistance design and where recommended in writing by sprayed fire-resistive material manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fire protection.

### 3.3 APPLICATION

- A. Construct fire protection assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fire protection Work.
- B. Comply with sprayed fire-resistive material manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fire protection; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Coordinate application of fire protection with other construction to minimize need to cut or remove fire protection.
  - 1. Do not begin applying fire protection until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.
  - 2. Defer installing ducts, piping, and other items that would interfere with applying fire protection until application of fire protection is completed.
- D. Metal Decks:
  - 1. Do not apply fire protection to underside of metal deck substrates until concrete topping, if any, is completed.
  - 2. Do not apply fire protection to underside of metal roof deck until roofing is completed; prohibit roof traffic during application and drying of fire protection.
- E. Install auxiliary materials as required, as detailed, and according to fire-resistance design and sprayed fire-resistive material manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by sprayed fire-resistive material manufacturer.
- F. Spray apply fire protection to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by sprayed fire-resistive material manufacturer.
- G. Extend fire protection in full thickness over entire area of each substrate to be protected.
- H. Install body of fire protection in a single course unless otherwise recommended in writing by sprayed fire-resistive material manufacturer.
- I. Cure fire protection according to sprayed fire-resistive material manufacturer's written instructions.
- J. Do not install enclosing or concealing construction until after fire protection has been applied, inspected, and tested and corrections have been made to deficient applications.

### 3.4 CLEANING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

### 3.5 PROTECTION

- A. Protect fire protection, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fire protection is without damage or deterioration at time of Substantial Completion.



### 3.6 REPAIRS

- A. As installation of other construction proceeds, inspect fire protection and repair damaged areas and fire protection removed due to work of other trades.
- B. Repair fire protection damaged by other work before concealing it with other construction.
- C. Repair fire protection by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION

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## **SECTION 07 81 23 - INTUMESCENT FIRE PROTECTION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Mastic and intumescent fire-resistive coatings.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review products, design ratings, restrained and unrestrained conditions, thicknesses, and other performance requirements.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For the following:
  - 1. Mastic and intumescent fire-resistive coatings.
  - 2. Substrate primers.
  - 3. Topcoat.
- B. Shop Drawings: Framing plans or schedules, or both, indicating the following:
  - 1. Extent of fire protection for each construction and fire-resistance rating.
  - 2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
  - 3. Minimum mastic and intumescent fire-resistive coating thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
  - 4. Treatment of mastic and intumescent fire-resistive coating after application.
- C. Samples: For each exposed product and for each color and texture specified, 4 inches square in size.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Product Certificates: For each type of mastic and intumescent fire-resistive coating.
- C. Evaluation Reports: For mastic and intumescent fire-resistive coating, from ICC-ES.
- D. Field quality-control reports.

#### **1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by mastic and intumescent fire-resistive coating manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

## 1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fire protection when ambient or substrate temperature is 50 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fire protection, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fire protection dries thoroughly.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fire protection, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.
- B. Source Limitations: Obtain fire protection for each fire-resistance design from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
- D. Asbestos: Provide products containing no detectable asbestos.

### 2.2 MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS

- A. Mastic and Intumescent Fire-Resistive Coating : Manufacturer's standard, factory-mixed formulation or factory-mixed, multicomponent system consisting of intumescent base coat and topcoat, and complying with indicated fire-resistance rating.
  - 1. Manufacturers: Subject to compliance with requirements, provide Hilti, Inc.; Fire Finish 120+, or equivalent products by one of the following:
    - a. Carboline Company; a subsidiary of RPM International.
    - b. Contego International Inc.
    - c. International Protective Coatings.
    - d. Isolatek International.
  - 2. Basis of Design UL Assembly for Columns: UL BXUV.Y634
  - 3. Other steel applications: Comply with Engineering Judgements, acceptable to the authority having jurisdiction, following this section, or provided by alternate manufacturers.
  - 4. Application: Designated for "exterior" and "conditioned interior space purpose" use by a qualified testing agency acceptable to authorities having jurisdiction.
  - 5. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
  - 6. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: 25 or less.
    - b. Smoke-Developed Index: 50 or less.
  - 7. Hardness: Not less than 6, Type D durometer, according to ASTM D2240.

### 2.3 AUXILIARY MATERIALS

- A. Provide auxiliary materials that are compatible with mastic and intumescent fire-resistive coating and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

- B. Substrate Primers: 2-part epoxy primer approved by mastic and intumescent fire-resistive coating manufacturer and complying with required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Topcoat: Suitable for application over mastic and intumescent fire-resistive coating, Sherwin Williams; Acrolon 218 HS Acrylic Polyurethane or equivalent; recommended in writing by mastic and intumescent fire-resistive coating manufacturer for each fire-resistance design.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
  - 1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fire protection with substrates under conditions of normal use or fire exposure.
  - 2. Verify that objects penetrating fire protection, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
  - 3. Verify that substrates receiving fire protection are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fire protection application.
- B. Conduct tests according to mastic and intumescent fire-resistive coating manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Cover other work subject to damage from fallout or overspray of fire protection materials during application.
- B. Clean substrates of substances that could impair bond of fire protection.
- C. Prime substrates where included in fire-resistance design and where recommended in writing by mastic and intumescent fire-resistive coating manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fire protection.
- D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fire protection. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

#### **3.3 APPLICATION**

- A. Construct fire protection assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, topcoats, finishing, and other materials and procedures affecting fire protection Work.
- B. Comply with mastic and intumescent fire-resistive coating manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fire protection; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

- C. Coordinate application of fire protection with other construction to minimize need to cut or remove fire protection.
  - 1. Do not begin applying fire protection until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.
  - 2. Defer installing ducts, piping, and other items that would interfere with applying fire protection until application of fire protection is completed.
- D. Spray apply fire protection to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by mastic and intumescent fire-resistive coating manufacturer.
  - 1. Protect adjacent surfaces from overspray.
- E. Extend fire protection in full thickness over entire area of each substrate to be protected.
- F. Install body of fire protection in a single course unless otherwise recommended in writing by mastic and intumescent fire-resistive coating manufacturer.
  - 1. If multiple courses are required, apply additional coats within the recoating time specified by manufacturer.
- G. Provide a uniform finish complying with description indicated for each type of fire protection material and matching finish approved for required mockups.
- H. Cure fire protection according to mastic and intumescent fire-resistive coating manufacturer's written instructions.
- I. Do not install enclosing or concealing construction until after fire protection has been applied, inspected, and tested and corrections have been made to deficient applications.
- J. Finishes: Where indicated, apply fire protection to produce the following finishes:
  - 1. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.

#### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
  - 1. Test and inspect as required by the IBC, Subsection 1705.14, "Mastic and Intumescent Fire-Resistant Coatings."
- B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fire protection for the next area until test results for previously completed applications of fire protection show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.
- C. Fire protection will be considered defective if it does not pass tests and inspections.
  - 1. Remove and replace fire protection that does not pass tests and inspections, and retest.
  - 2. Apply additional fire protection, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- D. Prepare test and inspection reports.

#### 3.5 CLEANING

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

3.6 PROTECTION

- A. Protect fire protection, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fire protection is without damage or deterioration at time of Substantial Completion.

3.7 REPAIRS

- A. As installation of other construction proceeds, inspect fire protection and repair damaged areas and fire protection removed due to work of other trades.
- B. Repair fire protection damaged by other work before concealing it with other construction.
- C. Repair fire protection by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION

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## **SECTION 07 84 13 - PENETRATION FIRESTOPPING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Penetrations in fire-resistance-rated walls.
  - 2. Penetrations in horizontal assemblies.
  - 3. Penetrations in smoke barriers.
- B. Related Requirements:
  - 1. Section 07 84 43 "Joint Firestopping" for joints in or between fire-resistance-rated construction, at exterior curtain-wall/floor intersections, and in smoke barriers.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.
  - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly developed in accordance with current International Firestop Council (IFC) guidelines. Obtain approval of authorities having jurisdiction prior to submittal.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Listed System Designs: For each penetration firestopping system, for tests performed by a qualified testing agency.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

#### **1.6 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

#### **1.7 COORDINATION**

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.

- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Test-Response Characteristics:
  - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
  - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
    - a. Penetration firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with listed system designs published by a qualified testing agency.
      - 1) UL in its online directory "Product iQ."
      - 2) Intertek Group in its "Directory of Building Products."

### **2.2 PENETRATION FIRESTOPPING SYSTEMS**

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems are to be compatible with one another, with the substrates forming openings, and with penetrating items if any.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. 3M Fire Protection Products.
    - b. A/D Fire Protection Systems Inc.
    - c. Grabber Construction Products.
    - d. Hilti, Inc.
    - e. NUCO Inc.
    - f. RectorSeal Firestop; a CSW Industrials Company.
    - g. Specified Technologies, Inc.
    - h. Tremco, Inc.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479.
  - 1. F-Rating: Not less than the fire-resistance rating of the wall penetrated.
  - 2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.
- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479.
  - 1. F-Rating: At least one hour, but not less than the fire-resistance rating of the floor penetrated.
  - 2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor. The following floor penetrations do not require a T-rating:
    - a. Those within the cavity of a wall.
    - b. 4-inch or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.
- D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479.

1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening and no more than 50-cfm cumulative total for any 100 sq. ft. at both ambient and elevated temperatures.
- E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.
- F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
  1. Permanent forming/damming/backing materials.
  2. Substrate primers.
  3. Collars.
  4. Steel sleeves.

## 2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric strips for use around combustible penetrants.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Compressible, removable, and reusable intumescent pillows encased in fire-retardant polyester or glass-fiber cloth. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.
- J. Fire-Rated Cable Sleeve Kits: Complete kits designed for new or existing cable penetrations through walls to accept standard accessories.
- K. Thermal Wrap: Flexible protective wrap tested and listed for up to 2-hour fire ratings in accordance with ASTM E814/UL 1479 for membrane penetrations or ASTM E1725/UL 1724 for thermal barrier and circuit integrity protection.
- L. Fire-Rated Cable Pathways: Single or gangable device modules composed of a steel raceway with integral intumescent material and requiring no additional action in the form of plugs, twisting closure, putty, pillows, sealant, or otherwise to achieve fire and air-leakage ratings.
- M. Retrofit Device for Cable Bundles: Factory-made, intumescent, collar-like device for firestopping existing over-filled cable sleeves and capable of being installed around projecting sleeves and cable bundles.

- N. Wall-Opening Protective Materials: Intumescent, non-curing putty pads or self-adhesive inserts for protection of electrical switch and receptacle boxes.
  - O. Fire-Rated HVAC Retaining Angles: Steel angle system with integral intumescent firestop gasket for use around rectangular steel HVAC ducts without fire dampers.
  - P. Firestop Plugs: Flexible, re-enterable, intumescent, foam-rubber plug for use in blank round openings and cable sleeves.
  - Q. Fire-Rated Cable Grommet: Molded two-piece grommet made of plenum-grade polymer and foam inner core for sealing small cable penetrations in gypsum walls up to 1/2 inch diameter.
  - R. Closet Flange Gasket: Molded, single-component, flexible, intumescent gasket for use beneath a water closet (toilet) flange in floor applications.
  - S. Endothermic Wrap: Flexible, insulating, fire-resistant, endothermic wrap for protecting membrane penetrations of utility boxes, critical electrical circuits, communications lines, and fuel lines.
- 2.4 MIXING
- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
  - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
  - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

#### **3.3 INSTALLATION OF PENETRATION FIRESTOPPING SYSTEMS**

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.

- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
  - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
  - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
  - 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Designation of applicable testing and inspecting agency.
  - 4. Date of installation.
  - 5. Manufacturer's name.
  - 6. Installer's name.

### 3.5 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

END OF SECTION

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## **SECTION 07 84 43 - JOINT FIRESTOPPING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Joints in or between fire-resistance-rated construction.
  - 2. Joints at exterior curtain-wall/floor intersections.
- B. Related Requirements:
  - 1. Section 07 84 13 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers.
  - 2. Section 07 95 13.13 "Interior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for interior floors, walls, and ceilings.
  - 3. Section 07 95 13.16 "Exterior Expansion Joint Cover Assemblies" for fire-resistive manufactured expansion-joint cover assemblies for exterior building walls, soffits, and parapets.
  - 4. Section 09 22 16 "Non-Structural Metal Framing" for firestop tracks for metal-framed partition heads.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Joints in or between fire-resistance-rated construction.
  - 2. Joints at exterior curtain-wall/floor intersections.
- B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
  - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly developed in accordance with current International Firestop Council (IFC) guidelines.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Listed System Designs: For each joint firestopping system, for tests performed by a qualified testing agency.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

#### **1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

## 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

## 1.8 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.

## PART 2 - PRODUCTS

### 2.1 SOURCE LIMITATIONS

- A. Obtain joint firestop systems for each type of joint opening indicated from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
  - 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
  - 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
    - a. Joint firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with Listed System Designs published by a qualified testing agency.
      - 1) UL in its online directory "Product iQ."
      - 2) Intertek Group in its "Directory of Building Products."
- B. Rain/Water Resistance: For perimeter fire-barrier system applications, where inclement weather or greater-than-transient water exposure is expected, use products that dry rapidly and cure in the presence of atmospheric moisture sufficient to pass ASTM D6904 early rain-resistance test (24-hour exposure).

### 2.3 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems must accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
  - 1. Joint firestopping systems that are compatible with one another, with the substrates forming openings, and with penetrating items, if any.
  - 2. Provide products that, upon curing, do not re-emulsify, dissolve, leach, breakdown, or otherwise deteriorate over time from exposure to atmospheric moisture, sweating pipes, ponding water or other forms of moisture.
  - 3. Provide firestop products that do not contain ethylene glycol.



- B. For aluminum curtain-wall assemblies with one- or two-piece rectangular mullions at least 2-1/2 by 5 inches, provide perimeter fire-barrier system that does not require direct screw attachment to mullions and transoms to support and fasten curtain-wall insulation. System to be tested in accordance with ASTM E2307 for up to 2-hour fire resistance and with ASTM E1233 for wind cycling equivalent to 108 mph wind for 500 cycles.
- C. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. 3M Fire Protection Products.
    - b. A/D Fire Protection Systems Inc.
    - c. Balco; a CSW Industrials Company.
    - d. ClarkDietrich.
    - e. Grabber Construction Products, Inc.
    - f. Hilti, Inc.
    - g. Marino\WARE.
    - h. NUCO Inc.
    - i. Owens Corning.
    - j. ROCKWOOL.
    - k. Specified Technologies, Inc.
    - l. Tremco Incorporated.
  - 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- D. Joints at Exterior Curtain-Wall/Floor Intersections: Provide joint firestopping systems with rating determined per ASTM E2307.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. 3M Fire Protection Products.
    - b. Balco; a CSW Industrials Company.
    - c. Hilti, Inc.
    - d. NUCO Inc.
    - e. Owens Corning.
    - f. ROCKWOOL.
    - g. Specified Technologies, Inc.
    - h. Tremco Incorporated.
  - 2. F-Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
- E. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.

#### 2.4 PREFORMED, FOAM JOINT SEALS

- A. Preformed, Foam Joint Seals: Manufacturer's standard joint seal manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce them in precompressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field-applied adhesive for bonding to substrates.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. EMSEAL Joint Systems, Ltd.
    - b. MM Systems Corporation.
    - c. Nystrom, Inc.

- d. Pecora Corporation.
- 2. Design Criteria:
  - a. Nominal Joint Width: As indicated on Drawings.
  - b. Movement Capability -50 percent/+50 percent.
  - c. F-Rating: Equal to or exceeding the fire-resistance rating of the wall assembly.

## 2.5 ACCESSORIES

- A. Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
  - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
  - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Apply a suitable bond-breaker to prevent three-sided adhesion in applications where this condition occurs, such as the intersection of a gypsum wall to floor or roof assembly where the joint is backed by a steel ceiling runner or track.

### 3.3 INSTALLATION

- A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
  - 1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.

2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

#### 3.4 INSTALLATION OF PREFORMED, FOAM JOINT SEALS

- A. General: Comply with preformed joint seal manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
  1. Install each length of seal immediately after removing protective wrapping.
  2. Firmly secure compressed joint seals to joint gap side to obtain full bond using exposed pressure-sensitive adhesive or field-applied adhesive as recommended by manufacturer.
  3. Do not pull or stretch material. Produce seal continuity at splices, ends, turns, and intersections of joints.
  4. For applications at low ambient temperatures, heat foam joint seal material in compliance with manufacturer's written instructions.

#### 3.5 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
  1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 ft. from end of wall and at intervals not exceeding 30 ft..
- B. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
  1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
  2. Contractor's name, address, and phone number.
  3. Designation of applicable testing agency.
  4. Date of installation.
  5. Manufacturer's name.
  6. Installer's name.

#### 3.6 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

END OF SECTION

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## **SECTION 07 92 00 - JOINT SEALANTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Joint sealants, including joint backing, tape, and primer.
  - 2. Labor, material, tools, equipment, and services necessary for and reasonably incidental to the execution of caulking and sealant work shown on the Drawings or specified herein.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.
- C. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
  - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  - 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- D. Field-Adhesion-Test Reports: For each sealant application tested.
- E. Sample Warranties: For special warranties.

#### **1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

## 1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
  2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.
  3. Stain Testing: Use ASTM C 1248 to determine stain potential of sealant when in contact with masonry substrates.
  4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
  5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
  7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
  2. Conduct field tests for each kind of sealant and joint substrate.
  3. Notify Architect seven days in advance of dates and times when test joints will be erected.
  4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
    - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
      - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
  6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

## 1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
  2. When joint substrates are wet.
  3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
  4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

## 1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
  - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
  - 2. Disintegration of joint substrates from causes exceeding design specifications.
  - 3. Mechanical damage caused by individuals, tools, or other outside agents.
  - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## PART 2 - PRODUCTS

### 2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following:
  - 1. Sealants and sealant primers for nonporous substrates shall have a VOC content of 250 g/L or less.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
- D. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- E. Stain-Test-Response Characteristics: Where sealants are specified to be non-staining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

### 2.2 ELASTOMERIC JOINT SEALANTS

- A. Acceptable Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Dow Corning Corporation
  - 2. GE Advanced Materials
  - 3. Pecora Corporation
  - 4. Sika Corporation, Construction Products Division
  - 5. Tremco Incorporated

- B. Type 1: Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT, G, M, A, and O. Equivalent to Tremco Spectrem 2.
- C. Type 2: Single-Component, Nonsag, Moisture-Curing Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 35, for Use NT, M, A, and O. Equivalent to Tremco Dymonic FC.
- D. Type 3: Multi-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type M, Grade P, Class 25, Uses T, M, and O. Equivalent to Tremco THC-900/901.
- E. Type 4: Single-Component, Nonsag, Acrylic-Latex Joint Sealant: ASTM C 834, Type OP, Grade NF, formulated to be paintable. Equivalent to Tremco Tremflex 834.
- F. Type 5: Single-Component, Nonsag, Mildew-Resistant, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Uses NT, G, A, and O. Equivalent to Tremco Tremsil 200.

### 2.3 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

### 2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:



- a. Concrete.
  - b. Masonry.
  - c. Unglazed surfaces of ceramic tile.
  - d. Exterior insulation and finish systems.
- 3. Remove laitance and form-release agents from concrete.
- 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
  - a. Metal.
  - b. Glass.
  - c. Porcelain enamel.
  - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
  - 1. Remove excess sealant from surfaces adjacent to joints.
  - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

### 3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
    - a. Perform 5 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
    - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
  2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
    - a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
  3. Inspect tested joints and report on the following:
    - a. Whether sealants filled joint cavities and are free of voids.
    - b. Whether sealant dimensions and configurations comply with specified requirements.
    - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.
  4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
  5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

### 3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

### 3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### 3.7 JOINT-SEALANT SCHEDULE

- A. EXTERIOR
1. Perimeters of exterior wall openings: Type 1

2. Expansion and control joints in exterior surfaces of poured-in place concrete walls: Type 1
3. Control and expansion joints in exterior surfaces of unit masonry and cast stone work: Type 1
4. Metal wall panels and soffits joints: Type 1
5. Joints in sheetmetal, flashings, and joints above counterflashing receivers: Type 1 or as required in Section 07 62 00
6. Joints between dissimilar materials: Type 1
7. Control and isolation joints in horizontal concrete: Type 3

**B. INTERIOR**

1. Perimeters of exterior wall openings as detailed on Drawings: Type 2
2. Control and expansion joints on the interior of exterior poured-in-place concrete walls: Type 2
3. Movement Joints in casework and countertops: Type 2
4. Control and expansion joints on the interior of exterior surfaces of unit masonry walls: Type 2
5. Perimeters of interior frames: Type 4
6. Interior masonry vertical control joints (block-to-block) block-to-concrete, and intersecting masonry wall: Type 4
7. Joints at tops of non-load bearing masonry walls at the underside of structure: Type 4
8. Joints between dissimilar materials: Type 4
9. Perimeter of toilet room fixtures (e.g. sinks, urinals, waterclosets): Type 5
10. Control and isolation joints in horizontal concrete: Type 3

END OF SECTION

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## **SECTION 07 92 16.13 - RIGID SECURITY JOINT SEALANTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Rigid sealant for use in areas accessible to inmates.
  - 2. Joint backing, tape, and primer.
  - 3. Labor, material, tools, equipment, and services necessary for and reasonably incidental to the execution of sealant work shown on the Drawings or specified herein.
- B. Related Requirements:
  - 1. Section 07 84 43: Joint Firestopping
  - 2. Section 07 92 00: Joint Sealants

#### **1.3 SYSTEM PERFORMANCE**

- A. Provide joint sealants that have been produced and installed to establish and maintain watertight and airtight continuous seals.

#### **1.4 REFERENCES**

- A. Sealant and Waterproofers Institute
  - 1. "Sealants: The Professionals Guide".

#### **1.5 PRECONSTRUCTION TESTING**

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
  - 1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
  - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint sealant backings, secondary seals, and miscellaneous materials.
  - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  - 4. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
  - 5. Testing will not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Field Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
  - 1. Locate test joints where directed by A/E.
  - 2. Conduct field tests for each kind of joint substrate and sealant application.
  - 3. Notify Owner and A/E seven days in advance of dates and times when test joints will be installed.
  - 4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.

5. Test Method: Test joint sealants according to Method A, Field Applied Sealant Joint Hand Pull Tab per ASTM C 1193.
6. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field Adhesion Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

#### 1.6 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each joint sealant product required, including instructions for joint preparation and joint sealant application.
- B. Samples: Submit cured strip samples of actual product of each color selected by A/E.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Preinstallation Conference: Submit two copies of minutes of the conference.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- C. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
  1. Materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants.
  2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
- D. Preconstruction Field Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- E. Warranties: Sample of special warranties.

#### 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years at least 3 joint sealant applications similar in type and size to that of this Project and who will assign mechanics from these earlier applications to this Project, of which one will serve as lead mechanic.
- B. Employ only qualified workers thoroughly skilled and specially trained in the techniques of caulking, who can demonstrate to the satisfaction of the A/E their ability to fill joints solidly and neatly.
- C. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.
- D. Application and Mixing Requirements: Mix and apply sealants in strict accordance with the manufacturer's printed directions. Initial mixing and application shall be under the direct supervision of the manufacturer's representative.
- E. Field Construction Mock-Up: Prior to preinstallation conference, apply rigid sealants in joints of field-constructed mock-ups of assemblies specified in other sections that are indicated to receive elastomeric joint sealant specified in this Section.

- F. Preinstallation Conference: Prior to installation of joint sealants, meet at project site with Prime Contractor, Sealant Subcontractor and Foreman. Inform Architect and Owner of scheduled meeting date. Purpose of the meeting will be to review mock-ups, sealant installation methods and recommendations, workmanship, and address any questions. Prime Contractor shall provide at least 72 hours advance notice to participants prior to convening preinstallation conference and record significant conference discussions, agreements, and disagreements, including required corrective measures and actions. Distribute minutes of the conference to each party present and other parties requiring information.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multicomponent materials.
- B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.
- C. Do not use caulking materials that have been stored for a period of time exceeding the maximum recommended shelf life of the materials.

#### 1.10 FIELD CONDITIONS

- A. Examination: Examine Drawings and verify that all joints are properly detailed and proportioned for expansion and/or control, as recommended in writing by the sealant manufacturer. Immediately notify A/E of any deviations.
- B. Environmental Requirements: Do not proceed with the installation of sealants under adverse weather conditions when joint to be sealed is damp, wet or frozen, or when ambient and substrate temperatures are below or above the manufacturer's recommended limitations for installation. Consult with manufacturer for specific instructions before proceeding.

#### 1.11 WARRANTY

- A. Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within the warranty period of two (2) years from date of Substantial Completion.
- B. Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within the following warranty periods from date of Substantial Completion.
  - 1. Warranty Period: Ten (10) years.
- C. Warranties specified in this article exclude deterioration or failure of joint sealants from the following:
  - 1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
  - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
  - 3. Mechanical damage caused by individuals, tools, or other outside agents.
  - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS, GENERAL**

- A. Compatibility: Provide joint sealants, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Two-part epoxy Joint Sealants: Comply with ASTM C881 and other requirements indicated for each liquid-applied joint sealant specified.
- C. VOC Content: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the limits for VOC content specified in Section 01 81 13 .

### **2.2 RIGID DETENTION JOINT SEALANTS**

- A. Basis-of-Design Product (Sealant Type 6):
  - 1. Multi-Component, Nonsag, High-Solids, High-Modulus Epoxy Compound, Pick-Proof Joint Sealant; ASTM C 881, Type 1, Grade 3. Equivalent to Pecora Corporation DynaPoxy EP-1200 with the following physical properties:
    - a. Compressive Strength: ASTM D 695, 11,000 psi
    - b. Hardness, Shore D: ASTM C 661, 70 (max. 72 hours)
- B. Acceptable Manufacturers: Subject to compliance with requirements, available manufacturers offering alternate products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Dow Corning Corporation
  - 2. GE Advanced Materials
  - 3. Sika Corporation, Construction Products Division

### **2.3 JOINT SEALANT BACKING**

- A. General: Provide sealant backings of material and type which are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonwaxing, nonextruding strips of flexible, nongassing plastic foam of material indicated below; nonabsorbent to water and gas and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Provide either open cell polyurethane foam or closed-cell polyethylene foam, subject to approval of sealant manufacturer, for cold-applied sealants only. Open cell joint backing not permitted in exterior wall construction.
- D. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

### **2.4 MISCELLANEOUS MATERIALS**

- A. Primer: Provide type recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated. Verify whether primer is staining or nonstaining prior to application.
- B. Masking Tape: Provide nonstaining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.



## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Installer shall inspect joints indicated to receive joint sealants for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance. Installer shall notify A/E in writing listing any conditions detrimental to performance of joint sealant work. Do not allow joint sealant work to proceed until unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Cleaning of Joints:
- B. Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturers and the following requirements:
  - 1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealant, including dust, paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil, grease, waterproofing, water repellents, water, surface dirt and frost.
  - 2. Clean concrete, masonry and similar porous joint substrate surfaces to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove laitance and form release agents from concrete.
  - 3. Clean metal, glass and other nonporous surfaces by chemical cleaners or other means that are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealants.
- C. Joint Priming: Prime joint substrates where recommended by joint sealant manufacturer. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond, do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### **3.3 INSTALLATION**

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Joint Sealant Backings: Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability. Do not leave gaps between ends of joint fillers. Do not stretch, twist, puncture or tear joint fillers. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- D. Bond Breaker Tape: Install bond breaker tape between sealants and joint fillers, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure.
  - 1. Do not install more joint sealant backing or bond breaker tape than can be caulked in one day.

- E. Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of concave joint configuration, unless otherwise indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

#### 3.4 PROTECTION AND CLEANING

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and reseal joints with new materials to produce joint sealant installations with repaired areas indistinguishable from original work.
- B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

#### 3.5 SCHEDULE

- A. Install rigid detention joint sealants where detailed on drawings, in areas accessible to inmates, and includes:
  - 1. Joints between detention plumbing fixtures and walls.
  - 2. Joints between detention window, door and similar frames and walls.
  - 3. Around recessed or surface mounted fixtures and equipment
  - 4. Between dissimilar materials.
  - 5. Masonry joints to a height of 10 feet AFF.
  - 6. All gaps exceeding 1/64 inch in thickness.

End of Section **07 92 16.13**

## **SECTION 07 95 13.13 - INTERIOR EXPANSION JOINT COVER ASSEMBLIES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Floor expansion joint covers.
  - 2. Wall expansion joint covers.
  - 3. Ceiling expansion joint covers.

#### **1.2 ACTION SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for expansion joint cover assemblies.
  - 1. Floor expansion joint covers.
  - 2. Wall expansion joint covers.
  - 3. Ceiling expansion joint covers.
- B. Shop Drawings: For each expansion joint cover assembly.
  - 1. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams showing entire route of each expansion joint.
  - 2. Where expansion joint cover assemblies change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
- C. Samples for Initial Selection: For each type of exposed finish.
  - 1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric-seal material.
- D. Samples for Verification: For each type of expansion joint cover assembly, full width by 6 inches long in size.
- E. Expansion Joint Cover Assembly Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
  - 1. Manufacturer and model number for each expansion joint cover assembly.
  - 2. Expansion joint cover assembly location cross-referenced to Drawings.
  - 3. Nominal, minimum, and maximum joint width.
  - 4. Movement direction.
  - 5. Materials, colors, and finishes.
  - 6. Product options.
  - 7. Fire-resistance ratings.

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: For each fire-resistance-rated expansion joint cover assembly, for tests performed by a qualified testing agency.

### **PART 2 - PRODUCTS**

#### **2.1 ASSEMBLY DESCRIPTION**

- A. Furnish units in longest practicable lengths to minimize field splicing.
- B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

- C. See Expansion Joint Cover Schedule at end of this section for specific basis-of-design products.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Balco; a CSW Industrials Company.
    - b. Construction Specialties, Inc.
    - c. Nystrom, Inc.
    - d. inpro Corporation.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Provide expansion joint cover assemblies with fire barriers identical to those of systems tested for fire resistance according to UL 2079 or ASTM E1966 by a qualified testing agency.
  - 1. Hose Stream Test: Wall-to-wall and wall-to-ceiling assemblies to be subjected to hose stream testing.
- B. Expansion Joint Design Criteria:
  - 1. Type of Movement: Wind sway.
    - a. Nominal Joint Width: As indicated on Drawings.

## 2.3 FLOOR EXPANSION JOINT COVERS

- A. Elastomeric-Seal Floor Joint Cover: Assembly consisting of elastomeric seal anchored to frames fixed to sides of joint gap.
  - 1. Application: Floor to floor and Floor to wall.
  - 2. Installation: Surface mounted.
  - 3. Load Capacity:
    - a. Uniform Load: 50 lb/sq. ft..
    - b. Concentrated Load: 300 lb.
    - c. Maximum Deflection: 0.0625 inch.
  - 4. Fire-Resistance Rating: Not less than that indicated on Drawings.
  - 5. Exposed Metal:
  - 6. Seal: Preformed elastomeric membrane or extrusion.
    - a. Color: As selected by Architect from manufacturer's full range.

## 2.4 WALL EXPANSION JOINT COVERS

- A. Metal-Plate Wall Joint Cover: Metal cover plate fixed on one side of joint gap and free to slide on other.
  - 1. Application: Wall to wall and Wall to corner.
  - 2. Exposed Metal:
    - a. Aluminum: Clear anodic, Class I.
- B. Elastomeric-Seal Wall Joint Cover: Assembly consisting of elastomeric seal anchored to frames fixed to sides of joint gap.

## 2.5 CEILING EXPANSION JOINT COVERS

- A. Metal-Plate Ceiling Joint Cover: Metal cover plate fixed on one side of joint gap and free to slide on other.
  - 1. Application: Ceiling to ceiling and Wall to ceiling.
  - 2. Exposed Metal:
    - a. Aluminum: Mill.

- B. Elastomeric-Seal Acoustical Ceiling Joint Cover: Elastomeric-seal assembly designed for use in acoustical ceilings.
  - 1. Application: Ceiling to ceiling and Wall to ceiling.
  - 2. Exposed Metal:
    - a. Aluminum: Clear anodic, Class I.
  - 3. Seal: Preformed elastomeric membranes or extrusions.
    - a. Color: As selected by Architect from manufacturer's full range.

## 2.6 MATERIALS

- A. Aluminum: ASTM B221, Alloy 6063-T5 for extrusions; ASTM B209, Alloy 6061-T6 for sheet and plate.
  - 1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
- B. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.
- C. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to comply with performance criteria for required fire-resistance rating.

## 2.7 ALUMINUM FINISHES

- A. Mill finish.
- B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

## 2.8 ACCESSORIES

- A. Manufacturer's standard attachment devices. Include anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.
- B. Notify Architect where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

### 3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.
  - 1. Install frames in continuous contact with adjacent surfaces.
    - a. Shimming is not permitted.
  - 2. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
  - 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
  - 4. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.
- C. Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
  - 1. Provide in continuous lengths for straight sections.
  - 2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
  - 3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.
- E. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.
- F. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion joint cover assembly materials and associated work so complete assemblies comply with performance requirements.
  - 1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

### 3.4 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion joint cover assemblies. Reinstall cover plates or seals prior to Substantial Completion.

### 3.5 MOVEMENT JOINT COVER SCHEDULE

- A. Balco USA products listed to establish level of quality. Product series indicated. Provide products from indicated series to comply with fire ratings where applicable. Alternate products by other listed manufacturers meeting or exceeding performance of listed systems acceptable.
- B. Floor-To-Floor
  - 1. General – 75FPE
  - 2. Firerated (room S1012/L1074): 2H75FPE
  - 3. Vinyl tile to vinyl tile: 75FTE

- 4. Carpet to carpet: 75FCE
  - 5. Carpet to carpet recessed (where furnishings require flush flooring): 75FP
- C. Floor-to-Wall
  - 1. General: 75FVPE
  - 2. Carpet (recessed): 75FVP
- D. Wall-to-Wall
  - 1. General: WD
  - 2. General corner: WDC
- E. Wall-to-Ceiling
  - 1. Gyp wall to gyp ceiling: WDC
  - 2. Gyp wall to ACT ceiling: 75FCAC
- F. Ceiling-to-Ceiling
  - 1. Gyp to gyp: WD
  - 2. ACT to ACT: 75FCA

END OF SECTION

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## **SECTION 07 95 13.16 - EXTERIOR EXPANSION JOINT COVER ASSEMBLIES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Exterior expansion joint covers.
- B. Related Requirements:
  - 1. Section 07 71 29 "Manufactured Roof Expansion Joints" for factory-fabricated roof expansion joint cover assemblies.

#### **1.2 ACTION SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for expansion joint cover assemblies.
  - 1. Exterior expansion joint covers.
- B. Shop Drawings: For each expansion joint cover assembly.
  - 1. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams showing entire route of each expansion joint.
  - 2. Where expansion joint cover assemblies change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
- C. Samples: For each exposed expansion joint cover assembly and for each color and texture specified, full width by 6 inches long in size.
- D. Expansion Joint Cover Assembly Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
  - 1. Manufacturer and model number for each expansion joint cover assembly.
  - 2. Expansion joint cover assembly location cross-referenced to Drawings.
  - 3. Nominal, minimum, and maximum joint width.
  - 4. Movement direction.
  - 5. Materials, colors, and finishes.
  - 6. Product options.
  - 7. Fire-resistance ratings.

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: For each fire-resistance-rated expansion joint cover assembly, for tests performed by a qualified testing agency.

### **PART 2 - PRODUCTS**

#### **2.1 ASSEMBLY DESCRIPTION**

- A. Furnish units in longest practicable lengths to minimize field splicing.
- B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Provide expansion joint cover assemblies with fire barriers identical to those of systems tested for fire resistance according to UL 2079 or ASTM E1966 by a qualified testing agency.
  - 1. Hose Stream Test: Wall-to-wall and wall-to-soffit assemblies shall be subjected to hose stream testing.
- B. Expansion Joint Design Criteria :
  - 1. Type of Movement: Wind sway.
    - a. Nominal Joint Width: As indicated on Drawings.

## 2.3 EXTERIOR EXPANSION JOINT COVERS

- A. Exterior Metal-Plate Joint Cover: Assembly consisting of sliding metal cover plate in continuous contact with gaskets mounted on metal frames fixed to sides of joint gap.
  - 1. Manufacturers: Subject to compliance with requirements, provide Balco CMX and CMXL Series Joint Cover Assemblies, or equivalent products by one of the following:
    - a. Construction Specialties, Inc.
    - b. MM Systems Corporation.
    - c. Nystrom, Inc.
    - d. inpro Corporation.
  - 2. Application: Wall to wall.
  - 3. Installation: Surface mounted.
  - 4. Fire-Resistance Rating: Not less than that indicated on Drawings.
  - 5. Exposed Metal:
    - a. Aluminum: Clear anodic, Class I.
- B. Preformed Foam Joint Seals: Manufacturer's standard joint seal manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field-applied adhesive for bonding to substrates.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Balco; a CSW Industrials Company.
    - b. EMSEAL Joint Systems, Ltd.
    - c. MM Systems Corporation.
    - d. Nystrom, Inc.
    - e. Pecora Corporation.
  - 2. Design Criteria:
    - a. Nominal Joint Width: As indicated on Drawings.
    - b. Movement Capability: -50 percent/+50 percent.
  - 3. Joint Seal Color: As selected by Architect from full range of industry colors.

## 2.4 MATERIALS

- A. Aluminum: ASTM B221, Alloy 6063-T5 for extrusions; ASTM B209, Alloy 6061-T6 for sheet and plate.
  - 1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.

- B. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.
  - C. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to comply with performance criteria for required fire-resistance rating.
  - D. Moisture Barrier: Manufacturer's standard, flexible elastomeric material.
- 2.5 ALUMINUM FINISHES
- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- 2.6 ACCESSORIES
- A. Moisture Barriers: Manufacturer's standard continuous, waterproof membrane within joint and attached to substrate on sides of joint.
    - 1. Provide where indicated on Drawings.
  - B. Manufacturer's standard attachment devices. Include anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine surfaces where expansion joint cover assemblies will be installed for installation tolerances and other conditions affecting performance of the Work.
- B. Notify Architect where discrepancies occur that will affect proper expansion joint cover assembly installation and performance.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

#### **3.3 INSTALLATION**

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.
  - 1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
  - 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation.
  - 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
  - 4. Install frames in continuous contact with adjacent surfaces.
    - a. Shimming is not permitted.

5. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.
  - C. Preformed Foam Joint Seals: Install in compliance with manufacturer's written instructions. Install with minimum number of end joints.
    1. Install each length of seal immediately after removing protective wrapping.
    2. Firmly secure compressed joint seals to joint gap side to obtain full bond using exposed pressure-sensitive adhesive or field-applied adhesive as recommended by manufacturer.
    3. Do not pull or stretch material. Produce seal continuity at splices, ends, turns, and intersections of joints.
    4. For applications at low ambient temperatures, heat foam joint seal material in compliance with manufacturer's written instructions.
  - D. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.
  - E. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.
  - F. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion joint cover assembly materials and associated work so complete assemblies comply with performance requirements.
    1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.
  - G. Moisture Barrier Drainage: If indicated, provide drainage fitting and connect to drains.
- 3.4 CONNECTIONS
- A. Transition to Roof Expansion Joint Covers: Coordinate installation of exterior wall and soffit expansion joint covers with roof expansion joint covers specified in Section 07 71 29 "Manufactured Roof Expansion Joints." Install factory-fabricated units at transition between exterior walls and soffits and roof expansion joint cover assemblies.
- 3.5 PROTECTION
- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
  - B. Protect the installation from damage by work of other Sections.

END OF SECTION

**DIVISION 08**



## **SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section includes:
  - 1. Interior standard steel doors and frames.
  - 2. Exterior standard steel doors and frames.
- B. Related Requirements:
  - 1. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.
  - 2. Section 11 98 12 "Detention Doors and Frames" for hollow-metal doors and frames for detention facilities.

#### **1.2 DEFINITIONS**

- A. Minimum Thickness: Minimum thickness of base metal without coatings in accordance with NAAMM-HMMA 803 or ANSI/SDI A250.8.

#### **1.3 COORDINATION**

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
  - 1. Elevations of each door type.
  - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
  - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  - 4. Locations of reinforcement and preparations for hardware.
  - 5. Details of each different wall opening condition.
  - 6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
  - 7. Details of anchorages, joints, field splices, and connections.
  - 8. Details of accessories.
  - 9. Details of moldings, removable stops, and glazing.
- C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of fire-rated hollow-metal door and frame assembly for tests performed by a qualified testing agency indicating compliance with performance requirements.

## 1.7 CLOSEOUT SUBMITTALS

- A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
  - 1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Ceco Door; ASSA ABLOY.
  - 2. Curries Company; ASSA ABLOY.
  - 3. LaForce, Inc.
  - 4. Pioneer Industries.
  - 5. Republic Doors and Frames.
  - 6. Steelcraft; an Allegion brand.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
- B. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.36 deg Btu/F x h x sq. ft. when tested in accordance with ASTM C1363 or ASTM E1423.

## 2.3 INTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule.
  - 1. Doors:
    - a. Thickness: 1-3/4 inches.
    - b. Face: Uncoated steel sheet, minimum thickness of 0.042 inch.



- c. Edge Construction: Model 1, Full Flush.
  - d. Core: Kraft-paper honeycomb.
  - e. Fire-Rated Core: Manufacturer's standard vertical steel stiffener or laminated mineral board core for fire-rated doors.
2. Frames:
- a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
  - b. Sidelite Frames: Fabricated from same thickness material as adjacent door frame.
  - c. Construction: Full profile welded.
3. Exposed Finish: Prime.

#### 2.4 EXTERIOR STANDARD STEEL DOORS AND FRAMES

- A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 3; ANSI/SDI A250.4, Level A. At exterior locations. Basis of Design: Ceco Door; Trio-E with Mercury Thermal Break Frame.
  - 1. Assembly U-Value: 0.36 when tested according to NFRC 200.
  - 2. Doors:
    - a. Type: As indicated in the Door and Frame Schedule.
    - b. Thickness: 1-3/4 inches.
    - c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
    - d. Edge Construction: Model 1, Full Flush.
    - e. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
    - f. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
    - g. Core: Manufacturer's standard thermal insulation .
  - 3. Frames:
    - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A60 coating.
    - b. Construction: Full profile welded thermally broken.
  - 4. Exposed Finish: Prime.

#### 2.5 BORROWED LITES

- A. Fabricate of uncoated steel sheet, minimum thickness of 0.042 inch.
- B. Construction: Full profile welded.
- C. Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as metal as frames.
- D. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

#### 2.6 FRAME ANCHORS

- A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
  2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
  3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.
- B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized in accordance with ASTM A153/A153M, Class B.

## 2.7 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized in accordance with ASTM A153/A153M.
- E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.
- G. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

## 2.8 FABRICATION

- A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
1. Sidelite Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding, or by rigid mechanical anchors.
  2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
  3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
    - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- B. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with ANSI/SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
  2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.
- C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.
  2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
  3. Provide fixed frame moldings on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
  4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
  5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.
- 2.9 STEEL FINISHES
- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

#### **3.2 INSTALLATION**

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: Comply with ANSI/SDI A250.11.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
    - a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
    - b. Install frames with removable stops located on secure side of opening.
  2. Fire-Rated Openings: Install frames in accordance with NFPA 80.
  3. Floor Anchors: Secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  4. Solidly pack mineral-fiber insulation inside frames.

5. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
6. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
  - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
  - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.
  1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
  2. Fire-Rated Doors: Install doors with clearances in accordance with NFPA 80.
- D. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

### 3.3 REPAIR

- A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- B. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

## SECTION 08 12 16 - ALUMINUM FRAMES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Interior aluminum doors, door frames, and glazing frames not associated with entrance vestibules.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For aluminum frames:
  - 1. Include elevations, sections, and installation details for each wall-opening condition.
  - 2. Include details for each frame type, including dimensioned profiles and metal thicknesses.
  - 3. Include locations of reinforcements and preparations for hardware.
  - 4. Include details of anchorages, joints, field splices, connections, and accessories.
  - 5. Include details of moldings, removable stops, and glazing.
- C. Samples for Verification: For each type of the following products:
  - 1. Framing Member and Finish: 12 inches long. Include trim.
- D. Product Schedule: For aluminum frames. Use same designations indicated on Drawings. Coordinate with door hardware schedule and glazing.

#### 1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum frames to include in maintenance manuals.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide Special-Lite, Inc.; Omega Aluminum Frames or equivalent products by one of the following:
  - 1. Alpha Aluminum Products, Inc.
  - 2. Frameworks, Inc.; an ASSA ABLOY Group company.
  - 3. Versatrac Frames; a division of American Door Products Inc.
  - 4. Wilson Partitions; a division of Acradia, Inc.
- B. Source Limitations: Obtain aluminum frames from single source from single manufacturer.

#### 2.2 INTERIOR ALUMINUM DOORS, DOOR FRAMES, AND GLAZING FRAMES

- A. Aluminum Framing: ASTM B221, with alloy and temper required to suit structural and finish requirements, and not less than 0.062 inch thick.
- B. Door Frames: Extruded aluminum, reinforced for hinges, strikes, and closers.

- C. Glazing Frames: Extruded aluminum, for indicated glass thickness.
  - D. Trim: Extruded aluminum, not less than 0.062 inch thick; removable, snap-in casing trim and door stops, without exposed fasteners.
    - 1. Trim Style: Trim 150-1.
  - E. Doors:
    - 1. As specified in Section 08 14 16 "Flush Wood Doors."
  - F. Frame and Trim Finish: Clear-anodized aluminum.
- 2.3 ACCESSORIES
- A. Fasteners: Aluminum, nonmagnetic, stainless steel or other noncorrosive metal fasteners compatible with frames, stops, panels, reinforcement plates, hardware, anchors, and other items being fastened.
  - B. Door Silencers: Manufacturer's standard continuous mohair, wool pile, or vinyl seals in black color.
  - C. Glazing Gaskets: Manufacturer's standard extruded or molded rubber or plastic, to accommodate glazing thickness indicated; in black.
- 2.4 Door Hardware: As specified in Section 08 71 00 "Door Hardware." FABRICATION
- A. Provide concealed corner reinforcements and alignment clips for accurately fitted hairline joints at butted and mitered connections.
  - B. Factory prepare aluminum frames to receive templated mortised hardware; include cutouts, reinforcements, mortising, drilling, and tapping, according to the Door Hardware Schedule and templates furnished as specified in Section 08 71 00 "Door Hardware."
    - 1. Locate hardware cutouts and reinforcements as required by fire-rated label for assembly.
  - C. Fabricate frames for glazing with removable stops to allow glazing replacement without dismantling frame.
    - 1. Locate removable stops on the inside of spaces accessed by keyed doors.
  - D. Fabricate components to allow secure installation without exposed fasteners.
- 2.5 GENERAL FINISH REQUIREMENTS
- A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- 2.6 ALUMINUM FINISHES
- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify that wall thickness does not exceed standard tolerances allowed by throat size of indicated aluminum frame.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install aluminum frames plumb, rigid, properly aligned, and securely fastened in place; according to manufacturer's written instructions.
- B. Install frame components in the longest possible lengths with no piece less than 48 inches; components 96 inches or shorter shall be one piece.
  - 1. Use concealed installation clips to produce tightly fitted and aligned splices and connections.
  - 2. Secure clips to extruded main-frame components and not to snap-in or trim members.
  - 3. Do not leave screws or other fasteners exposed to view when installation is complete.
- C. Glass: Install glass according to Section 08 80 00 "Glazing" and aluminum-frame manufacturer's written instructions.
- D. Doors: Install doors aligned with frames and fitted with required hardware.
- E. Door Hardware: Install according to Section 08 71 00 "Door Hardware" and aluminum-frame manufacturer's written instructions.

### 3.3 ADJUSTING

- A. Inspect installation, correct misalignments, and tighten loose connections.
- B. Doors: Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly, and lubricate as recommended by manufacturer.
- C. Clean exposed frame surfaces promptly after installation, using cleaning methods recommended in writing by frame manufacturer and according to AAMA 609 & 610.
- D. Touch Up: Repair marred frame surfaces to blend inconspicuously with adjacent unrepaired surface as viewed by Architect. Remove and replace frames with damaged finish that cannot be satisfactorily repaired.

END OF SECTION

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## SECTION 08 14 16 - FLUSH WOOD DOORS

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Five-ply flush wood veneer-faced doors for transparent finish.
2. Factory finishing flush wood doors and frames.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

##### B. Related Requirements:

1. Section 06 40 23 "Interior Architectural Woodwork" for wood door frames.
2. Section 06 42 16 "Flush Wood Paneling" for requirements for veneers from the same flitches for both flush wood doors and flush wood paneling.
3. Section 08 11 13 "Hollow Metal Doors and Frames" for coordination with hollow metal frames.
4. Section 08 71 00 "Door Hardware" for coordination with door hardware.
5. Section 08 80 00 "Glazing" for glass view panels in flush wood doors.

#### 1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

##### A. Product Data: For each type of product, including the following:

1. Door core materials and construction.
2. Door edge construction
3. Door face type and characteristics.
4. Door trim for openings.
5. Door frame construction.
6. Factory-machining criteria.
7. Factory-finishing specifications.

##### B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:

1. Door schedule indicating door location, type, size, fire protection rating, and swing.
2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of blocking for hardware attachment.
6. Dimensions and locations of mortises and holes for hardware.
7. Clearances and undercuts.
8. Requirements for veneer matching.
9. Doors to be factory finished and application requirements.

##### C. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on bottom rail with opening number used on Shop Drawings.

#### 1.7 FIELD CONDITIONS

- A. Environmental Limitations:
  - 1. Do not deliver or install doors until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of construction period.
  - 2. Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during remainder of construction period.

#### 1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Delamination of veneer.
    - b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
    - c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
  - 2. Warranty also includes installation and finishing that may be required due to repair or replacement of defective doors.
  - 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

### **PART 2 - PRODUCTS**

#### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain flush wood doors indicated to be blueprint matched with paneling from single manufacturer.

#### 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Wood Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated on Drawings, based on testing at positive pressure in accordance with UL 10C or NFPA 252.

2.3 FLUSH WOOD DOORS, GENERAL

1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with the Contract Documents in addition to those of the referenced quality standard.
- B. Adhesives: Do not use adhesives that contain urea formaldehyde.
- C. Composite Wood Products: Products shall be made without urea formaldehyde.

2.4 SOLID-CORE FIVE-PLY FLUSH WOOD VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Doors, Solid-Core Five-Ply Veneer-Faced :

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Lambton Doors.
  - b. Masonite Architectural.
  - c. Oshkosh Door Company.
  - d. VT Industries Inc.
2. Performance Grade: ANSI/WDMA I.S. 1A Heavy Duty.
3. Architectural Woodwork Standards Grade: Premium.
4. Faces: Single-ply wood veneer not less than 1/50 inch thick.
  - a. Species: Red oak.
  - b. Cut: Plain sliced (flat sliced).
  - c. Match between Veneer Leaves: Slip match.
  - d. Assembly of Veneer Leaves on Door Faces: Balance match.
  - e. Room Match:
    - 1) Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet or more.
  - f. Blueprint Match: Where doors are hung in wood panel walls, provide doors with faces produced from same flitches as adjacent wood paneling and arranged to provide blueprint match with wood paneling. Comply with requirements in Section 06 42 16 "Flush Wood Paneling."
5. Exposed Vertical Edges: Same species as faces - Architectural Woodwork Standards edge Type A.
  - a. Fire-Rated Single Doors: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed vertical edges.
6. Core for Non-Fire-Rated Doors:
  - a. ANSI A208.1, Grade LD-1 particleboard.
    - 1) Provide doors with WDMA I.S. 10 structural-composite-lumber cores instead of particleboard cores for doors scheduled to receive exit devices in Section 08 71 00 "Door Hardware."
  - b. WDMA I.S. 10 structural composite lumber.
    - 1) Screw Withdrawal, Door Face: 475 lbf.
    - 2) Screw Withdrawal, Vertical Door Edge: 475 lbf.
7. Core for Fire-Rated Doors: As required to achieve fire-protection rating indicated on Drawings.

- a. Blocking for Mineral-Core Doors: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated on Drawings as needed to eliminate through-bolting hardware.
- 8. Construction: Five plies, hot-pressed bonded (vertical and horizontal edging is bonded to core), with entire unit abrasive planed before veneering.

## 2.5 LIGHT FRAMES

- A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
  - 1. Wood Species: Same species as door faces.
  - 2. Profile: Flush rectangular beads.
- B. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; with baked-enamel- or powder-coated finish; and approved for use in doors of fire-protection rating indicated on Drawings.

## 2.6 FABRICATION

- A. Factory machine doors for hardware that is not surface applied.
  - 1. Locate hardware to comply with DHI-WDHS-3.
  - 2. Comply with final hardware schedules, door frame Shop Drawings, ANSI/BHMA-156.115-W, and hardware templates.
  - 3. Coordinate with hardware mortises in metal frames, to verify dimensions and alignment before factory machining.
  - 4. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
- B. Openings: Factory cut and trim openings through doors.
  - 1. Light Openings: Trim openings with moldings of material and profile indicated.
  - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 08 80 00 "Glazing."

## 2.7 FACTORY FINISHING

- A. Comply with referenced quality standard for factory finishing.
  - 1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
  - 2. Finish faces, all four edges, edges of cutouts, and mortises.
  - 3. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Transparent Finish:
  - 1. Architectural Woodwork Standards Grade: Premium.
  - 2. Architectural Woodwork Standards System-11, Polyurethane, Catalyzed.
  - 3. Staining: Match Architect's sample. See Finish Schedule and Drawings.
  - 4. Sheen: Satin.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
  - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.

2. Reject doors with defects.
  - B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION
- A. Hardware: For installation, see Section 08 71 00 "Door Hardware."
  - B. Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
  - C. Install level, plumb, true, and straight.
    1. Install fire-rated doors and frames in accordance with NFPA 80.
  - D. Job-Fitted Doors:
    1. Align and fit doors in frames with uniform clearances and bevels as indicated below.
      - a. Do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors.
    2. Machine doors for hardware.
    3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
    4. Clearances:
      - a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
      - b. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.
      - c. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
      - d. Comply with NFPA 80 for fire-rated doors.
    5. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
    6. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.
  - E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
  - F. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- 3.3 ADJUSTING
- A. Operation: Rehang or replace doors that do not swing or operate freely.
  - B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

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## **SECTION 08 31 13 - ACCESS DOORS AND FRAMES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes access doors and frames for walls and ceilings.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, fire ratings, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Product Schedule: For access doors and frames.

#### **1.4 QUALITY ASSURANCE**

- A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:
  - 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, according to NFPA 252 or UL 10B.

#### **2.2 ACCESS DOORS AND FRAMES**

- A. Flush Access Doors with Concealed Flanges :
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Acudor Products, Inc.
    - b. Babcock-Davis.
    - c. JL Industries, Inc.; a division of the Activar Construction Products Group.
    - d. Larsens Manufacturing Company.
    - e. Milcor; Commercial Products Group of Hart & Cooley, Inc.
    - f. Nystrom, Inc.
  - 2. Description: Face of door flush with frame; with concealed flange for gypsum board installation and concealed hinge.
  - 3. Locations: Wall and ceiling.
  - 4. Door Size: As indicated.
  - 5. Uncoated Steel Sheet for Door: Nominal 0.060 inch, 16 gage, factory primed.

## 2.3 FIRE-RATED ACCESS DOORS AND FRAMES

- A. Fire-Rated, Flush Access Doors with Exposed Flanges:
  - 1. Latch and Lock: Self-latching door hardware, prepared for mortise cylinder.
- B. Fire-Rated, Flush Access Doors with Concealed Flanges:
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Acudor Products, Inc.
    - b. Babcock-Davis.
    - c. JL Industries, Inc.; a division of the Activar Construction Products Group.
    - d. Nystrom, Inc.
  - 2. Description: Door face flush with frame, ; with concealed flange for gypsum board installation, self-closing door, and concealed hinge.
  - 3. Locations: Wall.
  - 4. Fire-Resistance Rating: Not less than that of adjacent construction.
  - 5. Uncoated Steel Sheet for Door: Nominal 0.036 inch, 20 gage, factory primed.
  - 6. Frame Material: Same material, thickness, and finish as door.
  - 7. Latch and Lock: Self-closing, self-latching door hardware, prepared for mortise cylinder.

## 2.4 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.
- C. Frame Anchors: Same material as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

## 2.5 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
  - 1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.
- D. Latch and Lock Hardware:
  - 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
  - 2. Keys: Furnish two keys per lock and key all locks alike.
  - 3. Mortise Cylinder Preparation: Where indicated, prepare door panel to accept cylinder specified in Section 08 71 00 "Door Hardware."



2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
  - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

**PART 3 - EXECUTION**

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

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## **SECTION 08 31 13.53 - SECURITY ACCESS DOORS AND FRAMES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Security access doors and frames for walls.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for general requirements for detention work.
  - 2. Section 08 31 13 "Access Doors and Frames" for access doors and frames for nonsecurity applications.
  - 3. Section 09 57 53 "Security Ceiling Assemblies" for access through security ceilings.
  - 4. Section 09 91 23 "Interior Painting" for final finish requirements.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details materials, individual components and profiles, and finishes.
- B. Product Schedule: For security access doors and frames. Use same designations indicated on Drawings.

### **PART 2 - PRODUCTS**

#### **2.1 SECURITY ACCESS DOORS AND FRAMES**

- A. High-Security Flush Access Doors:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Acudor Products, Inc.
    - b. Babcock-Davis.
    - c. JL Industries, Inc.; a division of the Activar Construction Products Group.
    - d. Larsens Manufacturing Company.
    - e. Milcor; Commercial Products Group of Hart & Cooley, Inc.
    - f. Nystrom, Inc.
  - 2. Locations: Wall.
  - 3. Door Size: Minimum 24-inch by 24" or as noted on Drawings.
  - 4. Uncoated Steel Sheet for Door: Nominal 0.134 inch, 10 gage; factory primed.
  - 5. Frame Material: Same material, thickness, and finish as door.
  - 6. Hinges: Manufacturer's standard security hinge.
  - 7. Latch and Lock: Detention deadbolt with mortis key.

#### **2.2 MATERIALS**

- A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.

- C. Frame Anchors: Same type as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

### 2.3 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
- D. Latch and Lock Hardware:
  - 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
  - 2. Keys: Furnish two keys per lock and key all locks alike.
  - 3. Mortise Cylinder Preparation: Where indicated, prepare door panel to accept cylinder specified in Section 08 71 63 "Detention Door Hardware".

### 2.4 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Factory-Primed Finish: Apply manufacturer's standard lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.

### 3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

## **SECTION 08 34 63 - DETENTION DOORS AND FRAMES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Swinging detention doors.
  - 2. Detention frames.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for general requirements for detention work.
  - 2. Section 05 05 53 "Security Metal Fasteners" for Detention Applications.
  - 3. Section 07 92 16.13 "Rigid Security Joint Sealants" for perimeter sealants.
  - 4. Section 08 71 63 "Detention Door Hardware" for door hardware for detention doors.

#### **1.3 DEFINITIONS**

- A. Minimum-Thickness Steel: Indicated as the specified minimum thicknesses for base metal without coatings, according to NAAMM-HMMA 803.
- B. Nominal-Thickness Stainless Steel: Indicated as the specified thicknesses for which over- and under-thickness tolerances apply, according to ASTM A 480/A 480M.

#### **1.4 COORDINATION**

- A. Detention Equipment Contractor: Coordinate with Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for requirements of this Section that are to be performed by a Detention Equipment Contractor or other entity.
- B. Coordinate installation of anchorages for detention frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.

#### **1.5 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.6 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, core descriptions, label compliance, fire-resistance rating, and finishes for each detention door and frame type specified.
- B. Shop Drawings: In addition to requirements below, provide a schedule using same reference numbers for details and openings as those on Drawings:
  - 1. Elevations of each door type.
  - 2. Direction of swing.
  - 3. Inmate and non-inmate sides.
  - 4. Details of doors, including vertical and horizontal edge details, and metal thicknesses.
  - 5. Details of frames, including dimensioned profiles, and metal thicknesses.

6. Details of each different wall opening condition.
7. Details of anchorages, joints, field splices, and connections.
8. Details of food-pass openings.
9. Details of moldings, removable stops, and glazing.
10. Details of conduits, junction boxes, and preparations for electrically operated door hardware.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Welding certificates.
- C. Product Test Reports: For each type of detention hollow-metal door and frame assembly including vision and side lights, for tests performed by a qualified testing agency.
- D. Examination reports, documenting inspection of substrates, areas, and conditions.
- E. Anchor inspection reports, documenting inspections of built-in and cast-in anchors.
- F. Field quality-control reports, documenting inspections of installed products.
  1. Field quality-control certification, signed by Contractor and Detention Equipment Contractor.
- G. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

#### 1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  1. Security Fasteners: Furnish not less than one box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.
  2. Tools: Provide two sets of tools for installing and removing security fasteners.

#### 1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
  3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver detention hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
- B. Deliver detention frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store detention hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Habersham Metal Products Company.
  - 2. Trussbilt.
  - 3. Titan Steel Door.
  - 4. Claborn Manufacturing
- B. Source Limitations: Obtain detention doors and frames from single source from single manufacturer.

### **2.2 REGULATORY REQUIREMENTS**

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
  - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
  - 2. Oversize Fire-Rated Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
- B. Fire-Rated, Borrowed-Light Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

### **2.3 DETENTION DOOR AND FRAME ASSEMBLIES**

- A. Detention Door and Frame Assemblies: Provide detention door and frame assemblies that comply with the following, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project:
  - 1. Security Grade: Assemblies pass testing requirements in ASTM F 1450 for security grades specified.
  - 2. Bullet Resistance: Level 3 rated when tested according to UL 752.
  - 3. Tool-Attack Resistance: Small-tool-attack-resistance rated when tested according to UL 437 and UL 1034.
- B. Detention Frames: Provide sidelight and borrowed-light detention frames that comply with ASTM F 1592 and removable stop test according to NAAMM-HMMA 863, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.

### **2.4 DETENTION DOORS**

- A. General: Provide flush-design detention doors of seamless hollow construction, 2 inches thick unless otherwise indicated. Construct detention doors with smooth, flush surfaces without visible joints or seams on exposed faces or stile edges.
  - 1. For single-acting swinging detention doors, bevel both vertical edges 1/8 inch in 2 inches.
- B. Core Construction: Provide the following core construction of same material as detention door face sheets, welded to both detention door faces:

1. Truss-Stiffened Core: 0.013-inch- thick, steel, truncated triangular stiffeners extending between face sheets and for full height and width of door; with stiffeners welded to face sheets not more than 3 inches o.c. vertically and 2-3/4 inches horizontally. Fill spaces between stiffeners with insulation.
  - C. Vertical Edge Channels: 0.123-inch- thick, continuous channel of same material as detention door face sheets, extending full-door height at each vertical edge; welded to top and bottom channels to create a fully welded perimeter channel. Noncontiguous channel is permitted to accommodate lock-edge hardware only if lock reinforcement is welded to and made integral with channel.
  - D. Top and Bottom Channels: 0.123-inch- thick metal channel of same material as detention door face sheets, spot welded, not more than 4 inches o.c., to face sheets.
    1. Reinforce top edge of detention door with 0.053-inch- thick closing channel, welded so channel web is flush with top door edges.
  - E. Interior Detention Doors: Construct interior doors to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.
    1. Security Grade 1: Provide doors with face sheets of 0.093-inch- minimum-thickness, cold-rolled steel.
    2. Security Grade 2: Provide doors with face sheets of 0.093-inch- minimum-thickness, cold-rolled steel.
  - F. Exterior Detention Doors: Construct exterior doors to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.
    1. Security Grade 1: Provide doors with face sheets of 0.093-inch- minimum-thickness, metallic-coated, cold-rolled steel.
- 2.5 DETENTION FRAMES
- A. General: Provide fully welded detention frames with integral stops, of seamless construction without visible joints or seams. Fabricate detention frames with contact edges closed tight and corners mitered, reinforced, and continuously welded full depth and width of detention frame.
  - B. Stop Height: Provide minimum stop height of 0.625 inch for detention door openings and minimum stop height of 1-1/4 inches in security glazing or detention panel openings unless otherwise indicated.
  - C. Interior Detention Frames: Construct interior frames to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.
    1. Security Grade 1: Provide frames fabricated from 0.093-inch- minimum-thickness, cold-rolled steel.
    2. Security Grade 2: Provide frames fabricated from 0.093-inch- minimum-thickness, cold-rolled steel.
  - D. Exterior Detention Frames: Construct exterior frames to comply with materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances indicated in NAAMM-HMMA 863 and as specified.
    1. Security Grade 1: Provide frames fabricated from 0.093-inch- minimum-thickness, metallic-coated, cold-rolled steel.
  - E. Hardware Reinforcement: Fabricate reinforcing plates from same material as detention frame to comply with the following minimum thicknesses:
    1. Hinges and Pivots: 0.187 inch thick by 1-1/2 inches wide by 10 inches long.



2. Strikes, Flush Bolts, and Closers: 0.187 inch thick.
  3. Surface-Mounted Hardware: 0.093 inch thick.
  4. Lock Pockets: 0.123 inch thick at non-inmate side, welded to face sheet. Provide 0.123-inch- thick, lock protection plate for attachment to lock pocket with security fasteners.
- F. Hardware Enclosures: Provide enclosures and junction boxes for electrically operated detention door hardware, interconnected with UL-approved, 1/2-inch- diameter conduit and connectors.
1. Access Plates: Where indicated for wiring installation, provide access plates to junction boxes, fabricated from same material and thickness as face sheet and fastened with at least four security fasteners spaced not more than 6 inches o.c.
- G. Mullions and Transom Bars: Provide closed or tubular mullions and transom bars where indicated. Fasten mullions and transom bars at crossings and to jambs by butt welding. Reinforce joints between detention frame members with concealed clip angles or sleeves of same metal and thickness as detention frame.
- H. Jamb Anchors: Weld jamb anchors to detention frames near hinges and directly opposite on strike jamb or as required to secure detention frames to adjacent construction.
1. Number of Anchors: Provide two anchors per jamb plus the following:
    - a. Detention Door Frames: One additional anchor for each 18 inches, or fraction thereof, above 54 inches in height.
    - b. Detention Frames with Security Glazing or Detention Panels: One additional anchor for each 18 inches, or fraction thereof, above 36 inches in height.
  2. Masonry Anchors: Adjustable, corrugated or perforated, strap-and-stirrup anchors to suit detention frame size; formed of same material and thickness as detention frame; with strap not less than 2 inches wide by 10 inches long.
  3. Embedded Anchors: Provide detention frames with removable faces at jambs where embedded anchors are indicated. Anchors consist of the following three parts:
    - a. Embedded Plates: Steel plates, 0.188 inch thick by 4 inches wide by 6 inches long. Continuously weld two steel bars, 1/2 inch in diameter and 10 inches long with 2-inch 90-degree turndown on ends, to the embedded end of each plate. Weld steel angles, 0.188 inch thick by 2 by 2 by 4 inches long, to the exposed end of each plate. Embed at locations to match frame angles.
    - b. Frame Angles: Steel angles, 0.188 inch thick by 2 by 2 by 4 inches long, welded to detention frames with 1-inch- long welds at each end of angle.
    - c. Connector Angles: Steel angles, of size required, to connect frame angles and embedded plates.
  4. Postinstalled Anchors: Minimum 1/2-inch- diameter, concealed bolts with expansion shields or inserts. Provide conduit spacer from detention frame to wall, welded to detention frame. Reinforce detention frames at anchor locations.
- I. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, formed of same material and thickness as detention frame, and as follows:
1. Monolithic Concrete Slabs: Clip anchors, with two holes to receive fasteners, welded to bottom of jambs and mullions with at least four spot welds per anchor.
  2. Separate Topping Concrete Slabs: Adjustable anchors with extension clips, allowing not less than 2-inch height adjustment, welded to jambs and mullions with at least four spot welds per anchor. Terminate bottom of detention frames at finish floor surface.
- J. Rubber Door Silencers: Except on weather-stripped detention doors, drill stops in strike jambs to receive three silencers on single-detention-door frames and drill head jamb stop to receive two silencers on double-detention-door frames. Keep holes clear during construction.

- K. Grout Guards: Provide factory-installed grout guards of same material as detention frame, welded to detention frame at back of hardware cutouts, silencers, and glazing-stop screw preparations to close off interior of openings and prevent mortar or other materials from obstructing hardware operation or installation.

## 2.6 MOLDINGS AND STOPS

- A. Provide fixed moldings on inmate side of glazed openings and removable stops on non-inmate side.
  - 1. Height: As required to provide minimum 1-inch glass engagement, but not less than 1-1/4 inches.
  - 2. Fixed Moldings: Formed from same material as detention door and frame face sheets, but not less than 0.093 inch thick, and spot welded to face sheets a maximum of 5 inches o.c.
  - 3. Removable Stops: Formed from 0.123-inch- thick angle, of same material as detention door face sheets. Secure with button head security fasteners spaced uniformly not more than 6 inches o.c. and not more than 2 inches from each corner, and as necessary to satisfy performance requirements. Form corners with notched or mitered hairline joints.
- B. Coordinate rabbet width between fixed and removable stops with glass or panel type and installation type indicated.

## 2.7 MATERIALS

- A. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, CS (Commercial Steel), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.
- D. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- E. Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.
- F. Masonry Anchors: Fabricated from same steel sheet as door face.
- G. Embedded Anchors: Fabricated from mild steel shapes and plates, hot-dip galvanized according to ASTM A 153/A 153M.
- H. Post-Installed Anchors: Torque-controlled expansion anchors.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941/F 1941M, Class Fe/Zn 5, unless otherwise indicated.
  - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 (A4) stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
- I. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- J. Glazing: Comply with Section 08 88 53 "Security Glazing."
- K. Grout: Comply with ASTM C 476, with a slump of not more than 4 inches as measured according to ASTM C 143/C 143M.
- L. Insulation: Slag-wool-fiber/rock-wool-fiber or glass-fiber blanket insulation. ASTM C 665, Type I (unfaced); with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics. Minimum 1.5-lb/cu. ft. density.

- M. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
- N. Waterborne Asphaltic Emulsion Coating: Minimum 2.5-mil dry film thickness.

## 2.8 FABRICATION

- A. Fabricate detention doors and frames rigid, neat in appearance, and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Weld exposed joints continuously; grind, fill, dress, and make smooth, flush, and invisible. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerances: Fabricate detention doors and frames to comply with manufacturing tolerances indicated in NAAMM-HMMA 863.
- C. Fabricate multiple-opening detention frames with mullions that have closed tubular shapes and with no visible seams or joints.
- D. Exterior Detention Doors: Provide weep-hole openings in bottoms of detention doors to permit entrapped moisture to escape. Seal joints in top edges of detention doors against water penetration.
- E. Hardware Preparation: Factory prepare detention doors and frames to receive mortised hardware, including cutouts, reinforcement, mortising, drilling, and tapping, according to final Door Hardware Schedule and templates provided by detention door hardware supplier.
  - 1. Locate door hardware according to NAAMM-HMMA 863.
- F. Factory cut openings in detention doors.
- G. Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

## 2.9 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM-NOMMA 500, "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish detention doors and frames after assembly.

## 2.10 METALLIC-COATED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so surfaces are free of oil and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A 780/A 780M.
- B. Factory Priming for Field-Painted Finish: Apply shop primer specified in "Shop Primer" Subparagraph below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mil.
  - 1. Shop Primer: Manufacturer's or fabricator's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10 acceptance criteria; recommended by primer manufacturer for zinc-coated steel; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

## 2.11 STEEL SHEET FINISHES

- A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning".
- B. Factory Priming for Field-Painted Finish: Apply shop primer specified in "Shop Primer" Subparagraph below immediately after surface preparation and pretreatment. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 0.7 mil.
  - 1. Shop Primer: Manufacturer's or fabricator's standard, fast-curing, corrosion-inhibiting, lead- and chromate-free, universal primer complying with SDI A250.10 acceptance criteria; compatible with substrate and field-applied finish paint system indicated; and providing a sound foundation for field-applied topcoats despite prolonged exposure.

## 2.12 SECURITY FASTENERS

- A. Refer to Section 05 05 53 for Security Fastener requirements.

## 2.13 SEALANTS

- A. Refer to Section 07 92 16.13 for Security Sealant requirements.

## 2.14 ACCESSORIES

- A. Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.
- B. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch thick; with minimum 1/2-inch- diameter, headed studs welded to back of plate.
- C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- D. Pass-Through Openings: Fabricate flush openings using 0.093-inch- thick, interior channels of same material as detention door faces, inverted to be flush with openings, welded to inside of both face sheets and with corners fully welded. Mount shutters on non-inmate side of detention doors. Reinforce for locks and food-pass hinges.
  - 1. Inset Shutters: Fabricate from two steel plates, 0.123 inch thick, of same material as detention door face sheets, spot welded together and sized to inset inside opening and to prevent inmate tampering of lock and hinges.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention frame connections before detention frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Inspect embedded plate installations before installing detention frames to verify that plate installations comply with requirements. Prepare inspection reports.
  - 1. Remove and replace plates where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
  - 2. Perform additional inspections to determine compliance of replaced or additional work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory.
- B. Before installation and with shipping spreaders removed, adjust detention frames for squareness, alignment, twist, and plumbness to the following tolerances:
  - 1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb and perpendicular to frame head.
  - 2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of face.
  - 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of door rabbet.
  - 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

### 3.3 INSTALLATION

- A. General: Install detention doors and frames plumb, rigid, properly aligned, and securely fastened in place, complying with Drawings, schedules, and manufacturer's written instructions.
- B. Anchorage: Set detention frame anchorage devices according to details on Shop Drawings and according to anchorage device manufacturer's written instructions.
  - 1. Masonry Anchors: Coordinate frame installation to allow for solidly filling space between frames and masonry with grout.
  - 2. Embedded Anchors: Install embedded plates in wall surrounding frame openings to match frame angle locations.
  - 3. Postinstalled Anchors: Drill holes in existing construction at locations to match bolt locations, and install bolt expansion shields or inserts.
- C. Where detention frames are fabricated in sections due to shipping limitations, assemble frames and install angle splices at each corner, of same material and thickness as detention frame, and extend at least 4 inches on both sides of joint.
  - 1. Field splice only at approved locations. Weld, grind, and finish as required to conceal evidence of splicing on exposed faces.
  - 2. Continuously weld and finish smooth joints between faces of abutted, multiple-opening, detention frame members.
  - 3. Field Welding: Comply with the following requirements:
    - a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    - b. Obtain fusion without undercut or overlap.
    - c. Remove welding flux immediately.
    - d. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Apply bituminous waterborne asphaltic emulsion coating to backs of frames before filling with grout.
- E. Placing Detention Frames: Install detention frames of sizes and profiles indicated. Set detention frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
  - 1. Embedded Anchors: Remove jamb faces from detention frames and set detention frames into opening. Weld steel connector angle to frame angle and to embedded plate with 1-inch- long welds at each end of connector angle to form a rigid frame assembly that is solidly anchored. Reinstall jamb faces using security fasteners.

2. Postinstalled Anchors: Install bolt. After bolt is tightened, weld bolt head to provide nonremovable condition. Grind, dress, and finish smooth welded bolt head.
  3. At fire-rated openings, install detention frames according to NFPA 80.
  4. Install detention frames with removable stops located on non-inmate side of opening.
- F. Grout: Fully grout detention frame jambs and heads. Completely fill space between frames and adjacent substrates. Hand trowel grout and take other precautions, including bracing detention frames, to ensure that frames are not deformed or damaged by grout forces.
- G. Security Sealant: Apply Type 6 epoxy security sealant at all exposed gaps between detention frames and adjacent substrates.
- H. Swinging Detention Doors: Fit non-fire-rated detention doors accurately in their frames, with the following clearances:
1. Between Doors and Frames at Jambs and Head: 1/8 inch.
  2. Between Edges of Pairs of Doors: 1/8 inch.
  3. At Door Sills with Threshold: 3/8 inch.
  4. At Door Sills without Threshold: 3/4 inch.
  5. Between Door Bottom and Nominal Surface of Floor Covering: 1/2 inch.
- I. Fire-Rated Detention Doors: Install with clearances as specified in NFPA 80.
- J. Smoke-Control Detention Doors: Install according to NFPA 105.
- K. Installation Tolerances: Comply with installation tolerances indicated in NAAMM-HMMA 863.
- L. Glazing: Comply with installation requirements in Section 08 88 53 "Security Glazing" unless otherwise indicated.
- 3.4 FIELD QUALITY CONTROL
- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
- B. Detention work will be considered defective if it does not pass tests and inspections.
- C. Perform additional inspections to determine compliance of replaced or additional work.
- D. Prepare field quality-control certification endorsed by Detention Equipment Contractor that states installed products comply with requirements in the Contract Documents.
- E. For verification that construction complies with requirements, select one detention door at random from detention doors delivered to Project and have it cut in half or otherwise taken apart.
1. Test Method: Verify weld strength by prying or chiseling door apart at edge seams, end channels, or stiffeners. Not more than 5 percent of welds may fail test.
    - a. If tested door fails, replace or rework all detention doors to bring them into compliance at Contractor's expense.
    - b. If tested door passes, replace tested door at Contractor's expense.
- F. Prepare test and inspection reports.
- 3.5 ADJUSTING AND CLEANING
- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including detention doors and frames that are warped, bowed, or otherwise unacceptable.
- B. Clean grout and other bonding material off detention doors and frames immediately after installation.

- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.
- D. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
  - 1. After finishing smooth field welds, apply air-drying primer.

END OF SECTION

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## **SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Aluminum-framed storefront systems.
  - 2. Aluminum-framed entrance door systems.
- B. Related Requirements:
  - 1. Section 08 12 16 "Aluminum Frames" for interior aluminum framing.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
  - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
  - 2. Include full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
    - a. Joinery, including concealed welds.
    - b. Anchorage.
    - c. Expansion provisions.
    - d. Glazing.
    - e. Flashing and drainage.
  - 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
  - 4. Include point-to-point wiring diagrams showing the following:
    - a. Power requirements for each electrically operated door hardware.
    - b. Location and types of switches, signal device, conduit sizes, and number and size of wires.
- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Delegated Design Submittal: For aluminum-framed entrances and storefronts including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Delegated design engineer qualifications.
- B. Sample warranties.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For aluminum-framed entrances and storefronts.

## 1.6 QUALITY ASSURANCE

### A. Qualifications:

1. Installers: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors.
2. Delegated Design Engineer: A professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.

### B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

## 1.7 WARRANTY

### A. Special Warranty: Installer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
  - a. Structural failures, including, but not limited to, excessive deflection.
  - b. Noise or vibration created by wind and thermal and structural movements.
  - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - d. Water penetration through fixed glazing and framing areas.
  - e. Failure of operating components.
2. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- #### A. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

#### A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:
  - a. Thermal stresses transferring to building structure.
  - b. Glass breakage.
  - c. Noise or vibration created by wind and thermal and structural movements.
  - d. Loosening or weakening of fasteners, attachments, and other components.

- e. Failure of operating units.
- B. Structural Loads:
  - 1. Wind Loads: As indicated on Drawings.
  - 2. Other Design Loads: As indicated on Drawings.
- C. Deflection of Framing Members Supporting Glass: At design wind load, as follows:
  - 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches.
  - 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
- D. Structural: Test in accordance with ASTM E330/E330M as follows:
  - 1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
  - 2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
  - 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- E. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:
  - 1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft..
- F. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:
  - 1. Thermal Transmittance (U-factor):
    - a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.39 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
    - b. Entrance Doors: U-factor of not more than 0.56 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
  - 2. Solar Heat-Gain Coefficient (SHGC):
    - a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.26 as determined in accordance with NFRC 200.
    - b. Entrance Doors: SHGC of not more than 0.16 as determined in accordance with NFRC 200.
  - 3. Air Leakage:
    - a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft. when tested in accordance with ASTM E283.
    - b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
  - 4. Condensation Resistance Factor (CRF):
    - a. Fixed Glazing and Framing Areas: CRF for the system of not less than 70 as determined in accordance with AAMA 1503.
    - b. Entrance Doors: CRF of not less than 68 as determined in accordance with AAMA 1503.
- G. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested in accordance with AAMA 501.5.
  - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
  - b. Low Exterior Ambient-Air Temperature: 0 deg F.
  - c. Interior Ambient-Air Temperature: 75 deg F.

## 2.3 STOREFRONT SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide Kawneer North America; Trifab VersaGlaze 451/451T or equivalent products by one of the following:
  1. EFCO Corporation.
  2. Oldcastle BuildingEnvelope (OBE); CRH Americas.
  3. Tubelite Inc.
  4. YKK AP America Inc.
- B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
  1. Exterior Framing Construction: Thermally broken.
  2. Interior Vestibule Framing Construction: Nonthermal.
  3. Glazing System: Retained mechanically with gaskets on four sides.
  4. Finish: Clear anodic finish.
  5. Fabrication Method: Field-fabricated stick system.
  6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  7. Steel Reinforcement: As required by manufacturer.
- C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

## 2.4 ENTRANCE DOOR SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide Kawneer North America; 350T Isulpour Thermal Entrances or equivalent products by one of the following:
  1. EFCO Corporation.
  2. Oldcastle BuildingEnvelope (OBE); CRH Americas.
  3. Tubelite Inc.
  4. YKK AP America Inc.
- B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
  1. Door Construction: 2- to 2-1/4-inch overall thickness, with minimum 0.125-inch- thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
    - a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
  2. Door Design: Medium stile; 3-1/2-inch nominal width.
  3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.

- a. Provide nonremovable glazing stops on outside of door.
- 4. Finish: Match adjacent storefront framing finish.

## 2.5 ENTRANCE DOOR HARDWARE

## 2.6 GLAZING

- A. Glazing: Comply with Section 08 80 00 "Glazing."

## 2.7 MATERIALS

- A. Sheet and Plate: ASTM B209.
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
- C. Structural Profiles: ASTM B308/B308M.
- D. Steel Reinforcement, if required:
  - 1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
  - 2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
  - 3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.
- E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

## 2.8 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
  - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
  - 2. Reinforce members as required to receive fastener threads.
  - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
  - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.
- C. Concealed Flashing: Dead-soft, 0.018-inch-thick stainless steel, complying with ASTM A240/A240M, of type recommended by manufacturer.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

## 2.9 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
  - 1. Profiles that are sharp, straight, and free of defects or deformations.

2. Accurately fitted joints with ends coped or mitered.
  3. Physical and thermal isolation of glazing from framing members.
  4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
1. At interior and exterior doors, provide compression weather stripping at fixed stops.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
  2. At exterior doors, provide weather sweeps applied to door bottoms.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.
- 2.10 ALUMINUM FINISHES
- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION, GENERAL**

- A. Comply with manufacturer's written instructions.
- B. Do not install damaged components.
- C. Fit joints to produce hairline joints free of burrs and distortion.
- D. Rigidly secure nonmovement joints.
- E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- F. Seal perimeter and other joints watertight unless otherwise indicated.
- G. Metal Protection:
  1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
  2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

- H. Set continuous sill members and flashing in full sealant bed, as specified in Section 07 92 00 "Joint Sealants," to produce weathertight installation.
  - I. Install joint filler behind sealant as recommended by sealant manufacturer.
  - J. Install components plumb and true in alignment with established lines and grades.
- 3.3 INSTALLATION OF GLAZING
- A. Install glazing as specified in Section 08 80 00 "Glazing."
- 3.4 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOORS
- A. Install entrance doors to produce smooth operation and tight fit at contact points.
    - 1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
    - 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware in accordance with entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- 3.5 ERECTION TOLERANCES
- A. Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
    - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
    - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
    - 3. Alignment:
      - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
      - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
      - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
    - 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

END OF SECTION

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## SECTION 08 88 13 - FIRE-RATED WINDOW ASSEMBLIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Fire-resistance-rated framing.
  - 2. Fire-resistance-rated glazing.

#### 1.2 DEFINITIONS

- A. Fire-Resistance-Rated Glazing: Glazing that prevents spread of fire and smoke and radiant heat and complies with requirements for rated walls and rated openings; capable of blocking radiant heat
- B. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- C. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

#### 1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples:
  - 1. For each type of glass product; 12 inches square.
  - 2. For each type of framing system: 6 inches long.
- C.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and glass testing agency.
- B. Product Certificates: For each type of glass and glazing product.
- C. Sample Warranties: For special warranties.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the NGA's Certified Glass Installer Program.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

## 1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install fire-resistant glazing until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature conditions at occupancy levels during remainder of construction period.

## PART 2 - PRODUCTS

### 2.1 SOURCE LIMITATIONS

- A. Glass: For each glass type, obtain from single source from single manufacturer.
- B. Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; deterioration of glazing materials; or other defects in construction.
- B. Structural Performance
  - 1. Design and size the system to withstand structural forces placed upon it without damage or permanent set when tested in accordance with ASTM E330 using load 1.5 times the design wind loads and of 10 seconds in duration.
  - 2. Positive wind load: as indicated on the drawings
  - 3. Negative wind Load: as indicated on the drawings
  - 4. Member deflection: Limit deflection of the edge of the glass normal to the plane of the glass to 1/175 of the glass edge length or 3/4 inch, whichever is less.
  - 5. Accommodate movement between storefront and adjoining systems

Coordinate the lbf/sq ft with those required in the field test at the end of the section.

- C. Air infiltration: Provide systems that allow a maximum air leakage through fixed glazed openings of 0.06 cfm/sq. ft. of area when tested per ASTM E 283 at a static air differential of 6.24 lbf/sq ft

Coordinate the lbf/sq ft with those required in the field test at the end of the section.

- D. Water Penetration
  - 1. Under Static pressure, provide systems that do not show uncontrolled water leakage when tested according to ASTM E 331 under static pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- E. Under Dynamic pressure, provide systems that do not show uncontrolled water leakage when tested according to AAMA 501.1 under static pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- F. Performance:
  - 1. Fire-rating: 60 minutes.
  - 2. Impact Safety Rating: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).
  - 3. Positive Pressure Test: UL 10C; passes.

## 2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organization below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. NGA Publications: "Glazing Manual."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, glass thickness, and safety glazing standard with which glass complies.

## 2.4 GLASS PRODUCTS

- A. Float Glass: ASTM C1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class I (clear) unless otherwise indicated, Quality-Q3.
  - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- C. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
  - 1. Construction: Laminate glass with polyvinyl butyral interlayer unless fire-protection or fire-resistance rating is based on another product.
  - 2. Interlayer Thickness: Provide thickness as needed to comply with requirements.
  - 3. Interlayer Color: Clear unless otherwise indicated.

## 2.5 FIRE-RESISTANCE-RATED WINDOWS

- A. General: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-resistance ratings indicated, based on testing in accordance with ASTM E119 or UL 263.
- B. Fire-Resistance-Rated Glazing Labeling: Permanently mark fire-resistance-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, test standard, that glazing is approved for use in walls, and fire-resistance rating in minutes.
- C. Fire-Resistance-Rated Framing: Fire-resistance-rated glazing with 60-minute rating requires framing from glass supplier, tested as an assembly complying with ASTM E119 or UL 263.
  - 1. Provide Manufacturer's standard aluminum-capped fire-resistant steel frames.
- D. Fire-Resistance-Rated Laminated Glass with Intumescent Interlayers: Laminated glass made from multiple plies of uncoated, clear float glass; with intumescent interlayers; complying with 16 CFR 1201, Category II.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Pilkington North America.
    - b. SAFTI FIRST Fire Rated Glazing Solutions.
    - c. Technical Glass Products.
    - d. Vetrotech Saint-Gobain.
  - 2. Provide in an insulated glazing unit complying with the requirements of Section 08 80 00.

## 2.6 GLAZING ACCESSORIES

- A. Provide glazing gaskets, glazing sealants, glazing tapes, setting blocks, spacers, edge blocks, and other glazing accessories that are compatible with glazing products and each other and are approved by testing agencies that listed and labeled fire-resistant glazing products with which products are used for applications and fire-protection ratings indicated.
- B. Intumescent Tape: Intumescent tape complying with the requirements of the tested assembly.
- C. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
  - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.7 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- C. Perimeter Insulation for Fire-Resistance-Rated Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

## 2.8 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

## 2.9 FINISHES

- A. Framing Finish: Match finish specified in Section 08 41 13.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with manufacturing and installation tolerances, including those for size, squareness, and offsets at corners, and for compliance with minimum required face and edge clearances.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate fire side and protected side. Label or mark units as needed so that fire side and protected side are readily identifiable. Do not use materials that leave visible marks in the completed Work.

### 3.3 GLAZING, GENERAL

- A. Use methods approved by testing agencies that listed and labeled fire-resistant glazing products.
- B. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches.
  - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- I. Set glass lites with proper orientation so that coatings face fire side or protected side as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.

- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

### 3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop, so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- D. Install gaskets so they protrude past face of glazing stops.

### 3.6 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION

## **SECTION 08 44 13 - GLAZED ALUMINUM CURTAIN WALLS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Glazed aluminum curtain wall systems:
    - a. Conventionally glazed.
- B. Related Requirements:
  - 1. Section 07 92 00 "Joint Sealants" for installation of joint sealants installed with glazed aluminum curtain walls and for sealants to the extent not specified in this Section.
  - 2. Section 08 44 33 "Sloped Glazing Assemblies" for sloped glazing.
  - 3. Section 08 80 00 "Glazing" for curtain wall glazing.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.
  - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
  - 2. Include full-size isometric details of each type of vertical-to-horizontal intersection of glazed aluminum curtain walls, showing the following:
    - a. Joinery, including concealed welds.
    - b. Anchorage.
    - c. Expansion provisions.
    - d. Glazing.
    - e. Flashing and drainage.
  - 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Delegated-Design Submittal: For glazed aluminum curtain walls, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data:
  - 1. For Installer.

2. For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the state in which Project is located.
  - B. Energy Performance Certificates: For glazed aluminum curtain walls, accessories, and components from manufacturer.
    1. Basis for Certification: NFRC-certified energy performance values for each glazed aluminum curtain wall.
  - C. Sample Warranties: For special warranties.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For glazed aluminum curtain walls to include in maintenance manuals.
- 1.7 QUALITY ASSURANCE
- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AGM) contractors.
  - B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
    1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.
- 1.8 WARRANTY
- A. Special Assembly Warranty: Manufacturer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
    1. Failures include, but are not limited to, the following:
      - a. Structural failures including, but not limited to, excessive deflection.
      - b. Noise or vibration created by wind and thermal and structural movements.
      - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      - d. Water penetration through fixed glazing and framing areas.
      - e. Failure of operating components.
    2. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design glazed aluminum curtain walls.
- B. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
  1. Glazed aluminum curtain walls shall withstand movements of supporting structure, including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.



2. Failure also includes the following:
  - a. Thermal stresses transferring to building structure.
  - b. Glass breakage.
  - c. Noise or vibration created by wind and thermal and structural movements.
  - d. Loosening or weakening of fasteners, attachments, and other components.
  - e. Failure of operating units.
- C. Structural Loads:
  1. Wind Loads: As indicated on Drawings.
  2. Other Design Loads: As indicated on Drawings.
- D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:
  1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans of greater than 13 feet 6 inches.
  2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
    - a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.
- E. Structural: Test in accordance with ASTM E330/E330M as follows:
  1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
  2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
  3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:
  1. No evidence of water penetration through fixed glazing and framing areas when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft. .
- G. Energy Performance: Certified and labelled by manufacturer for energy performance as follows:
  1. Thermal Transmittance (U-factor):
    - a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.43 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
  2. Solar Heat Gain Coefficient (SHGC):
    - a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.26 as determined in accordance with NFRC 200.
  3. Air Leakage:
    - a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested in accordance with ASTM E283.
  4. Condensation Resistance Factor (CRF):
    - a. Fixed Glazing and Framing Areas: CRF for the system of not less than 65 as determined in accordance with AAMA 1503.
- H. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
  1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested in accordance with AAMA 501.5.
  - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
  - b. Low Exterior Ambient-Air Temperature: 0 deg F.

## 2.2 SOURCE LIMITATIONS

- A. Obtain all components of curtain-wall system and storefront system, including framing and accessories, from single manufacturer.

## 2.3 GLAZED ALUMINUM CURTAIN WALL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide Kawneer North America; 1600 Wall System 1 or equivalent products by one of the following:
  1. EFCO Corporation.
  2. Wausau Window and Wall Systems; Apogee Wausau Group, Inc.
  3. YKK AP America Inc.
- B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
  1. Construction: Thermally broken.
  2. Glazing System: Retained mechanically with gaskets on four sides.
  3. Glazing Plane: Front.
  4. Finish: Clear anodic finish .
  5. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  6. Steel Reinforcement: As required by manufacturer.
- C. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
  1. Include snap-on aluminum trim that conceals fasteners.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- E. Entrance Door Systems: Comply with Section 08 41 13 "Aluminum-Framed Entrances and Storefronts".

## 2.4 GLAZING

- A. Glazing: Comply with Section 08 80 00 "Glazing."

## 2.5 MATERIALS

- A. Sheet and Plate: ASTM B209.
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
- C. Structural Profiles: ASTM B308/B308M.
- D. Steel Reinforcement:
  1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
  2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
  3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

- E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

## 2.6 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
  - 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
  - 2. Reinforce members as required to receive fastener threads.
  - 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
- B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
  - 1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.
- C. Concealed Flashing: Dead-soft, 0.018-inch- thick stainless steel, ASTM A240/A240M of type recommended by manufacturer.
- D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

## 2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
  - 1. Profiles that are sharp, straight, and free of defects or deformations.
  - 2. Accurately fitted joints with ends coped or mitered.
  - 3. Physical and thermal isolation of glazing from framing members.
  - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  - 5. Provisions for field replacement of glazing from exterior.
  - 6. Provisions for safety railings mounted on interior face of mullions.
  - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Fabricate components to resist water penetration as follows:
  - 1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
- E. Curtain-Wall Framing: Fabricate components for assembly using manufacturer's standard assembly method.
- F. Factory-Assembled Frame Units:
  - 1. Rigidly secure nonmovement joints.

2. Prepare surfaces that are in contact with structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
    3. Seal joints watertight unless otherwise indicated.
    4. Install glazing to comply with requirements in Section 08 80 00 "Glazing."
  - G. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.
- 2.8 ALUMINUM FINISHES
- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION, GENERAL**

- A. Comply with manufacturer's written instructions.
- B. Do not install damaged components.
- C. Fit joints to produce hairline joints free of burrs and distortion.
- D. Rigidly secure nonmovement joints.
- E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- F. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- G. Seal joints watertight unless otherwise indicated.
- H. Metal Protection:
  1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
  2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- I. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
- J. Install components plumb and true in alignment with established lines and grades.

#### **3.3 INSTALLATION OF GLAZING**

- A. Install glazing as specified in Section 08 80 00 "Glazing."

#### **3.4 ERECTION TOLERANCES**

- A. Install glazed aluminum curtain walls to comply with the following maximum tolerances:
  1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
  2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.

3. Alignment:
  - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
  - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
  - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

END OF SECTION

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## SECTION 08 44 33 - SLOPED GLAZING ASSEMBLIES

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Sloped glazing assemblies.
- B. Related Requirements:
  - 1. Section 08 44 13 "Glazed Aluminum Curtain Walls" for vertical curtain walls.
  - 2. Section 08 80 00 "Glazing" for glass requirements.

#### 1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For sloped glazing assemblies. Include plans, elevations, sections, full-size details, and attachments to other work.
  - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
  - 2. Include full-size isometric details of each type of vertical-to-horizontal intersection of sloped glazing assemblies, showing the following:
    - a. Joinery, including concealed welds.
    - b. Anchorage.
    - c. Expansion provisions.
    - d. Glazing.
    - e. Flashing and drainage.
  - 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- C. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- D. Delegated-Design Submittal: For sloped glazing assemblies, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data:
  - 1. For Installer.
  - 2. For professional engineer's experience with providing delegated-design engineering services of the type indicated, including documentation that engineer is licensed in the state in which Project is located.
- B. Energy Performance Certificates: For sloped glazing assemblies, accessories, and components from manufacturer.
  - 1. Basis for Certification: NFRC-certified energy performance values for each sloped glazing assembly.

- C. Product Test Reports: For sloped glazing assemblies, for tests performed by a qualified testing agency.
- D. Sample Warranties: For special warranties.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sloped glazing assemblies to include in maintenance manuals.
- B. Maintenance Data for Structural Sealant: For sloped glazing assemblies with structural glazing, to include in maintenance manuals. Include ASTM C1401 recommendations for postinstallation-phase quality-control program.

#### 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AGM) contractors.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
  - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

#### 1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Submit to structural glazing sealant manufacturer, for testing indicated below, Samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that is in close proximity to or is touching the structural or nonstructural sealants of a structural glazed system.
  - 1. Compatibility: Test materials or components using ASTM C1087.
  - 2. Adhesion: Test for adhesion or lack of adhesion of a structural sealant to the surface of another material or component using ASTM C1135.
  - 3. Submit no fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
  - 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  - 5. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
  - 6. Testing will not be required if data based on previous testing of current sealant products match those submitted.

#### 1.8 WARRANTY

- A. Special Assembly Warranty: Installer agrees to repair or replace components of sloped glazing assemblies that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures, including, but not limited to, excessive deflection.
    - b. Noise or vibration created by wind and thermal and structural movements.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - d. Water penetration through fixed glazing and framing areas.
    - e. Failure of operating components.



2. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design sloped glazing assemblies.
- B. General Performance: Comply with performance requirements specified, as determined by testing of sloped glazing assemblies representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
  - 1. Sloped glazing assemblies shall withstand movements of supporting structure, including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
  - 2. Failure also includes the following:
    - a. Thermal stresses transferring to building structure.
    - b. Glass breakage.
    - c. Noise or vibration created by wind and thermal and structural movements.
    - d. Loosening or weakening of fasteners, attachments, and other components.
- C. Structural Loads:
  - 1. Wind Loads: As indicated on Drawings.
  - 2. Other Design Loads: As indicated on Drawings.
- D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:
  - 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans of greater than 13 feet 6 inches.
  - 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
- E. Structural: Test in accordance with ASTM E330/E330M as follows:
  - 1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
  - 2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
  - 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:
  - 1. No evidence of water penetration through fixed glazing and framing areas when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft. .
- G. Energy Performance: Certified and labelled by manufacturer for energy performance as follows:
  - 1. Thermal Transmittance (U-factor):
    - a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.48 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
  - 2. Solar Heat Gain Coefficient (SHGC):
    - a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.29 as determined in accordance with NFRC 200.
  - 3. Air Leakage:

- a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested in accordance with ASTM E283.
  - 4. Condensation Resistance Factor (CRF):
    - a. Fixed Glazing and Framing Areas: CRF for the system of not less than 65 as determined in accordance with AAMA 1503.
- H. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
  - 2. Thermal Cycling: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested in accordance with AAMA 501.5.
    - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F.
    - b. Low Exterior Ambient-Air Temperature: 0 deg F.
- I. Structural-Sealant Joints:
  - 1. Designed to carry gravity loads of glazing.
- J. Structural Sealant: ASTM C1184. Capable of withstanding tensile and shear stresses imposed by sloped glazing assemblies without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.
  - 1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
  - 2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate, because sealant-to-substrate bond strength exceeds sealant's internal strength.

## 2.2 SOURCE LIMITATIONS

- A. Obtain all components of sloped glazing assemblies and glazed aluminum curtain walls, including framing and accessories, from single manufacturer.

## 2.3 SLOPED GLAZING ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, provide Kawneer North America; 1600 Sloped Glazing Assembly or equivalent products by one of the following:
  - 1. EFCO Corporation.
  - 2. Wausau Window and Wall Systems; Apogee Wausau Group, Inc.
  - 3. YKK AP America Inc.
- B. Framing Members: Manufacturer's standard, formed- or extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
  - 1. Construction: Thermally broken.
  - 2. Framing-Member Type: Self-supporting.
  - 3. Glazing System: Field-installed structural sealant at horizontal members (purlins) and pressure caps at rafters.
  - 4. Finish: Clear anodic finish.
  - 5. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
  - 6. Steel Reinforcement: As required by manufacturer.
- C. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.

1. Include snap-on aluminum trim that conceals fasteners.
- D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- 2.4 GLAZING
- A. Comply with Section 08 80 00 "Glazing" except as noted below.
  - B. Structural Glazing Sealants: ASTM C1184, chemically curing silicone formulation that is compatible with system components with which it comes into contact, specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in sloped glazing assembly indicated.
    1. Color: Black .
- 2.5 MATERIALS
- A. Sheet and Plate: ASTM B209.
  - B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
  - C. Structural Profiles: ASTM B308/B308M.
  - D. Steel Reinforcement:
    1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
    2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
    3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.
  - E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.
- 2.6 ACCESSORIES
- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
    1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
    2. Reinforce members as required to receive fastener threads.
    3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
  - B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.
    1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.
  - C. Concealed Flashing: Dead-soft, 0.018-inch- thick stainless steel, ASTM A240/A240M of type recommended by manufacturer.
  - D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.
- 2.7 FABRICATION
- A. Form or extrude aluminum shapes before finishing.
  - B. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
  2. Accurately fitted joints with ends coped or mitered.
  3. Physical and thermal isolation of glazing from framing members.
  4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- C. Fabricate components with internal guttering system or other means to drain water-passing joints, condensation occurring within framing members, and moisture migrating within sloped glazing assemblies to exterior.
- D. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.
- 2.8 ALUMINUM FINISHES
- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
- 2.9 SOURCE QUALITY CONTROL
- A. Structural Sealant: Perform quality-control procedures complying with ASTM C1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

### **PART 3 - EXECUTION**

- 3.1 EXAMINATION
- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 INSTALLATION, GENERAL
- A. Comply with manufacturer's written instructions.
- B. Do not install damaged components.
- C. Fit joints to produce hairline joints free of burrs and distortion.
- D. Rigidly secure nonmovement joints.
- E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
- F. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.
- G. Seal joints watertight unless otherwise indicated.
- H. Metal Protection:
1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
  2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- I. Install components to drain water-passing joints, condensation occurring within framing members, and moisture migrating within sloped glazing assemblies to exterior.

- J. Install components plumb and true in alignment with established lines and grades.
- 3.3 INSTALLATION OF GLAZING
- A. Install glazing as specified in Section 08 80 00 "Glazing."
- 3.4 INSTALLATION OF STRUCTURAL GLAZING
- A. Prepare surfaces that will contact structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
  - B. Set glazing into framing in accordance with sealant manufacturer and framing manufacturer's written instructions and standard practice. Use a spacer or backer as recommended by manufacturer.
  - C. Set glazing with proper orientation, so that coatings face exterior or interior as specified.
  - D. Apply structural sealant to completely fill cavity, in accordance with sealant manufacturer and framing manufacturers written instructions and in compliance with local codes.
  - E. Apply structural sealant at temperatures indicated by sealant manufacturer for type of sealant.
  - F. Allow structural sealant to cure in accordance with manufacturer's recommendations.
  - G. Clean and protect glass as indicated in Section 08 80 00 "Glazing."
- 3.5 INSTALLATION OF WEATHERSEAL SEALANT
- A. After structural sealant has completely cured, remove temporary retainers and insert backer rod between lites of glass, as recommended by sealant manufacturer.
  - B. Install weatherseal sealant to completely fill cavity, in accordance with sealant manufacturer's written instructions, to produce weatherproof joints.
- 3.6 ERECTION TOLERANCES
- A. Install sloped glazing assemblies to comply with the following maximum tolerances:
    - 1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
    - 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
    - 3. Alignment:
      - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
      - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
      - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
    - 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.
- 3.7 FIELD QUALITY CONTROL
- A. Structural-Sealant Adhesion: Test structural sealant in accordance with recommendations in ASTM C1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.
    - 1. Test a minimum of four areas.
    - 2. Repair installation areas damaged by testing.

END OF SECTION

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## **SECTION 08 56 59 - SERVICE AND TELLER WINDOW UNITS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes Service and teller window units where indicated on Drawings.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit construction details, material descriptions, dimensions of individual components and profiles, and finishes for window units.
- B. Shop Drawings: Submit plans, elevations, sections, details, attachments to other Work, and the following:
  - 1. Full-size section details of framing members, including reinforcement and stiffeners.
  - 2. Glazing details.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver window units in manufacturer's packaging complete with installation instructions. Store in protected area.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. General: Provide window units that comply with performance requirements specified as determined by testing manufacturer's standard assemblies representing those indicated for this Project.
- B. Ballistic-Resistance Performance: Provide glazing for window units that is listed and labeled as bullet resisting according to UL 752.

#### **2.2 SLIDING SERVICE WINDOW UNITS**

- A. Basis-of-Design Product: Equivalent to C.R. Laurence Co.; D1040A Daisy Model Pass-Thru Window Unit. Subject to compliance with requirements, a comparable product by other manufacturers also acceptable.
  - 1. Glass Type 2 as specified in Section 08 80 00.

#### **2.3 FIXED SPEAKER PORT WINDOW UNITS**

- A. Basis-of-Design Product: Equivalent to C.R. Laurence Co.; SCW103C CRL Custom Cashier Window. Subject to compliance with requirements a comparable product by other manufacturer also acceptable.
  - 1. Glass Type 2 as specified in Section 08 80 00.

#### **2.4 MATERIALS**

- A. Stainless Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666, Type 304.
- B. Aluminum Extrusions: Manufacturer's Standard alloy.

- C. Fasteners: Provide non-magnetic stainless steel or other materials warranted by the manufacturer to be non-corrosive and compatible with stainless steel window members, trim, anchors and other components of window units.
- D. Sealant: For sealants required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic, non-shrinking, and non-migrating. Comply with Section 07 92 00 for selection of exterior and interior perimeter sealants.

## 2.5 FABRICATION

- A. General: Fabricate window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.
- B. Framing: Fabricate perimeter framing, mullions, and glazing stops from stainless steel sheet. Fabricate window units with framing on four sides and no operable sash or ventilator. Provide weep holes and internal water passages for exterior window units to conduct infiltrating water to exterior.

## 2.6 FINISHES

- A. Stainless Steel: No. 4 finish.
- B. Aluminum: Clear anodized.

# PART 3 - EXECUTION

## 3.1 INSPECTION

- A. Inspect openings before beginning installation. Verify that rough or masonry opening is correct and the sill plate is level.

## 3.2 INSTALLATION

- A. Comply with manufacturer's specifications and recommendations for installation of window units and other components of the work.
- B. Framing Orientation: Incline window unit to degree recommended by window manufacturer, with top of frame slanted away from protected side of window.
- C. Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose.
- D. Install sealants and related backing materials around exterior and interior perimeters of windows in accordance with workmanship and installation requirements specified in Section 07 92 00.

## 3.3 CLEANING

- A. Clean surfaces promptly after installation of window units. Exercise care to avoid damage to finishes. Remove excess glazing and sealant compounds, dirt and other substances.
- B. Clean glass of preglazed units promptly after installation of window units. Remove glazing and sealant compounds, dirt and other substances. Comply with requirements for cleaning and maintenance in Section 08 80 00.



3.4 PROTECTION

- A. Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of substantial completion.

End of Section **08 56 59**

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## **SECTION 08 63 00 - METAL-FRAMED SKYLIGHTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes skylights with metal framing.
- B. Related Requirements:
  - 1. Refer to Section 01 23 00 "Alternates" for work of this section affected by alternate pricing.
  - 2. Section 05 40 00 "Cold-Formed Steel Framing" for support curbs.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for metal-framed skylights.
- B. Shop Drawings: For metal-framed skylights.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Indicate structural loadings and reactions to be transmitted to supporting curbs.
  - 3. Include details of provisions for assembly expansion and contraction and for draining moisture within the assembly to the exterior.
  - 4. Include full-size isometric details of each vertical-to-horizontal intersection of assembly, showing the following:
    - a. Joinery including concealed welds.
    - b. Anchorage.
    - c. Expansion provisions.
    - d. Glazing.
    - e. Flashing and drainage.
- C. Delegated-Design Submittal: For metal-framed skylights indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Product Test Reports: For metal-framed skylights, for tests performed by a qualified testing agency.
- C. Sample Warranties: For special warranties.

#### **1.6 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For metal-framed skylights to include in maintenance manuals.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of metal-framed skylights required for this Project.

## 1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of metal framed skylights that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including, but not limited to, excessive deflection.
    - b. Noise or vibration caused by thermal movements.
    - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
    - d. Adhesive or cohesive sealant failures.
    - e. Water leakage.
  - 2. Warranty Period: Five years from date of Substantial Completion.
- B. Special Aluminum-Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.
  - 1. Failures include, but are not limited to, checking, crazing, peeling, chalking, and fading of finishes.
  - 2. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design metal-framed skylights.
- B. Design framing and glazing infill assembly to support the following load requirements:
  - 1. Snow Load: 40 psf plus dead load.
  - 2. Wind Load: 40 psf negative or uplift load plus dead load.
- C. Deflection of Framing Members: At design wind pressure, as follows:
  - 1. Deflection Normal to Glazing Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding  $L/175$  of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
  - 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.
- D. Lateral Bracing of Framing Members: Compression flanges of flexural members are laterally braced by cross members with minimum depth equal to 50 percent of flexural member that is braced. Glazing does not provide lateral support.
- E. Fabrication and installation of unit skylights shall comply with Wisconsin Department of Commerce - Safety & Buildings.
- F. Air Infiltration: Metal-framed skylights with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of when tested according to ASTM E 283 at a minimum static-air-pressure difference of 6.24 lbf/sq. ft..

- G. Water Penetration under Static Pressure: Metal-framed skylights that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..
  - H. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
    - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
  - I. Condensation Resistance: Metal-framed skylights with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 53 when tested according to AAMA 1503.
    - 1. Haze Factor: Greater than 90 percent when tested according to ASTM D 1003.
  - J. Energy Performance: Provide metal-framed skylights with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
    - 1. Thermal Transmittance (U-Factor): Fixed glazing and framing areas shall have U-factor of not more than 0.65 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
- 2.2 METAL-FRAMED SKYLIGHTS
- A. Metal-Framed Skylights: Glazed skylight assemblies supported by aluminum framing.
    - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Acurlite Structural Skylights Inc.
      - b. Super Sky Products Inc.
      - c. United Skys, Inc.
      - d. Wasco Products, Inc.
      - e. Wisconsin Solar Design Inc.
  - B. Aluminum Framing Systems: Manufacturer's standard extruded-aluminum members of thickness required and reinforced as required to support imposed loads.
  - C. Aluminum: Alloy and temper as recommended in writing by manufacturer for type of use and finish indicated.
    - 1. Sheet and Plate: ASTM B 209.
    - 2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
    - 3. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
    - 4. Structural Profiles: ASTM B 308/B 308M.
  - D. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
    - 1. Include snap-on aluminum trim that conceals fasteners.
  - E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning skylight components.
  - F. Fasteners and Accessories: Manufacturer's standard, corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
    - 1. At pressure caps, use ASTM A 193/A 193M stainless-steel screws.
    - 2. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
    - 3. Reinforce members as required to receive fastener threads.
    - 4. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.
  - G. Anchor Bolts: ASTM A 307, Grade A, galvanized steel.

- H. Concealed Flashing: Manufacturer's standard, corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- I. Exposed Flashing and Closures: Manufacturer's standard aluminum components not less than 0.060 inch thick.
- J. Sealants: As specified in Section 07 92 00 "Joint Sealants."
- K. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

## 2.3 GLAZING

- A. Insulated Glass: Fabricate to IGCC-CBA standards. Units shall be hermetically sealed (dual sealed) with SIGMA Class A sealant type edge construction, and dry air or gas-filled air space enclosed by 2 sheets of glass and warranted for minimum of 10 years against failure of hermetic seal. Total unit thickness of 1-1/4 inches. Provide interior and exterior glass lites as follows:
  - 1. Interior Glass: Clear safety glass, Type I, Class 1, Quality q<sup>3</sup>, Kind heat-strengthened, laminated, 5/16-inch thick. Clear polyvinyl butryl (PVB) interlayer thickness of .060 inches.
  - 2. Exterior Glass: Clear float glass, Type I, Class 1, Quality q<sup>3</sup>, Kind heat-strengthened, with low emittance, high transmittance coating, 1/4-inch thick. Equivalent to PPG Solarban 60 (2) Clear.
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric types.
- D. Glazing Sealants: As recommended in writing by manufacturer.

## 2.4 FABRICATION

- A. Where practical, fit and assemble metal-framed skylights in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Fabricate aluminum components that, when assembled, have the following characteristics:
  - 1. Profiles that are sharp, straight, and free of defects or deformations.
  - 2. Accurately fitted joints with ends coped or mitered.
  - 3. Internal guttering systems or other means to drain water passing joints and moisture migrating within skylight to exterior.
  - 4. Physical and thermal isolation of glazing from framing members.
  - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
- C. Fabricate aluminum sill closures with weep holes and for installation as continuous component.
- D. Reinforce aluminum components as required to receive fastener threads.
- E. Factory-Glazed, Metal-Framed Skylights:
  - 1. Factory install glazing to comply with requirements in Section 08 80 00 "Glazing."
- F. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

## 2.5 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions.
  - 1. Do not install damaged components.
  - 2. Fit joints between aluminum components to produce hairline joints free of burrs and distortion.
  - 3. Rigidly secure nonmovement joints.
  - 4. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
  - 5. Seal joints watertight unless otherwise indicated.
- B. Metal Protection: Where aluminum will contact dissimilar materials, protect against galvanic action by painting contact surfaces with protective coating or by installing nonconductive spacers as recommended in writing by manufacturer for this purpose.
- C. Install continuous aluminum sill closure with weatherproof expansion joints and locked and sealed or welded corners. Locate weep holes at rafters.
- D. Install components to drain water passing joints, and moisture migrating within skylight to exterior.
- E. Install components plumb and true in alignment with established lines and elevations.
- F. Glazing: Install glazing as specified in Section 08 80 00 "Glazing."
- G. Erection Tolerances: Install metal-framed skylights to comply with the following maximum tolerances:
  - 1. Alignment: Limit offset from true alignment to 1/32 inch where surfaces abut in line, edge to edge, at corners, or where a reveal or protruding element separates aligned surfaces by less than 3 inches; otherwise, limit offset to 1/8 inch.
  - 2. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet but no greater than 1/2 inch over total length.

### 3.3 CLEANING AND PROTECTION

- A. Clean exposed surfaces immediately after installing skylights. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

- C. Protect skylights from contact with contaminating substances resulting from construction operations. If contaminating substances do contact skylight surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION



## SECTION 08 71 00 – DOOR HARDWARE

### PART 1 - GENERAL

#### 1.01 SUMMARY

##### A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components
3. Field verification, preparation and modification of existing doors and frames to receive new door hardware.

##### B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

##### C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
  - a. "Metal Doors and Frames"
  - b. "Flush Wood Doors"
  - c. "Stile and Rail Wood Doors"
  - d. "Interior Aluminum Doors and Frames"
  - e. "Aluminum-Framed Entrances and Storefronts"
  - f. "Stainless Steel Doors and Frames"
  - g. "Special Function Doors"
  - h. "Entrances"
6. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.
7. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
8. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

#### 1.02 REFERENCES

##### A. UL, LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies

3. UL 1784 - Air Leakage Tests of Door Assemblies
  4. UL 305 - Panic Hardware
- B. DHI - Door and Hardware Institute
1. Sequence and Format for the Hardware Schedule
  2. Recommended Locations for Builders Hardware
  3. Keying Systems and Nomenclature
  4. Installation Guide for Doors and Hardware
- C. NFPA – National Fire Protection Association
1. NFPA 70 – National Electric Code
  2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
  3. NFPA 101 – Life Safety Code
  4. NFPA 105 – Smoke and Draft Control Door Assemblies
  5. NFPA 252 – Fire Tests of Door Assemblies
- D. ANSI - American National Standards Institute
1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
  2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
  3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
  4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
  5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

### 1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
  - a. Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, “EXAMINATION” article, herein.
  - b. Review drawings and Sections from related trades to verify compatibility with specified hardware.
  - c. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
  - a. Wiring Diagrams: For power, signal, and control wiring and including:
    - 1) Details of interface of electrified door hardware and building safety and security systems.
    - 2) Schematic diagram of systems that interface with electrified door hardware.
    - 3) Point-to-point wiring.
    - 4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.

- a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule:

- a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
- b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
- c. Indicate complete designations of each item required for each opening, include:
  - 1) Door Index: door number, heading number, and Architect's hardware set number.
  - 2) Quantity, type, style, function, size, and finish of each hardware item.
  - 3) Name and manufacturer of each item.
  - 4) Fastenings and other pertinent information.
  - 5) Location of each hardware set cross-referenced to indications on Drawings.
  - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
  - 7) Mounting locations for hardware.
  - 8) Door and frame sizes and materials.
  - 9) Degree of door swing and handing.
  - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:

- a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
- c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
- e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

- C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
  - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
  - b. Include warranties for specified door hardware.

- D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
  - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
  - b. Catalog pages for each product.
  - c. Final approved hardware schedule edited to reflect conditions as installed.
  - d. Final keying schedule
  - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
  - f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
  - a. fire door assemblies, in compliance with NFPA 80.
  - b. required egress door assemblies, in compliance with NFPA 101.

#### 1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
  - a. For door hardware: DHI certified AHC or DHC.
  - b. Can provide installation and technical data to Architect and other related subcontractors.
  - c. Can inspect and verify components are in working order upon completion of installation.
  - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
  - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
  - b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive

pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

2. Smoke and Draft Control Door Assemblies:
    - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
    - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
  3. Electrified Door Hardware
    - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
  4. Accessibility Requirements:
    - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.
- C. Pre-Installation Meetings
1. Keying Conference
    - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      - 2) Preliminary key system schematic diagram.
      - 3) Requirements for key control system.
      - 4) Requirements for access control.
      - 5) Address for delivery of keys.
  2. Pre-installation Conference
    - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - b. Inspect and discuss preparatory work performed by other trades.
    - c. Inspect and discuss electrical roughing-in for electrified door hardware.
    - d. Review sequence of operation for each type of electrified door hardware.
    - e. Review required testing, inspecting, and certifying procedures.
    - f. Review questions or concerns related to proper installation and adjustment of door hardware.
  3. Electrified Hardware Coordination Conference:
    - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

#### 1.06 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

#### 1.07 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
  - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
  - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    - a. Mechanical Warranty
      - 1) Locks
        - a) Schlage L Series: 3 years
        - b) Schlage ND Series: 10 years
      - 2) Exit Devices
        - a) Von Duprin: 3 years
      - 3) Closers

- a) LCN 4000 Series: 30 years
- b. Electrical Warranty
  - 1) Exit Devices
    - a) Von Duprin: 1 year

## 1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Approval of products from manufacturers other than those listed as “Scheduled Manufacturer”, or “Acceptable Manufacturers” shall require an Architect approved substitution request.
  - 1. Where “Alternates by substitution request only” is noted, requests for other products shall not be considered without an Architect approved substitution request.
- B. Approval of manufacturers and/or products other than those listed as “Scheduled Manufacturer” or “Acceptable Manufacturers” in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in “Acceptable Manufacturers” is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer’s product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

### 2.02 MATERIALS

- A. Fabrication
  - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
  - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
  - 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “Metal Doors and Frames”, “Flush Wood Doors”, “Stile and Rail Wood Doors” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Modification and Preparation of Existing Doors: Where existing door hardware is indicated to be removed and reinstalled.

1. Provide necessary fillers, Dutchmen, reinforcements, and fasteners, compatible with existing materials, as required for mounting new opening hardware and to cover existing door and frame preparations.
  2. Use materials which match materials of adjacent modified areas.
  3. When modifying existing fire-rated openings, provide materials permitted by NFPA 80 as required to maintain fire-rating.
- C. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- D. Cable and Connectors:
1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
  2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
  3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

## 2.03 HINGES

- A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
    - a. Ives 5BB series
  2. Acceptable Manufacturers and Products:
    - a. Alternates by Substitution Request only
- B. Requirements:
1. Provide hinges conforming to ANSI/BHMA A156.1.
  2. Provide five knuckle, ball bearing hinges.
  3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
    - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
    - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
  4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
    - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
    - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
  5. 2 inches or thicker doors:
    - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
    - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
  6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.



7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
9. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - a. Steel Hinges: Steel pins
  - b. Non-Ferrous Hinges: Stainless steel pins
  - c. Out-Swinging Exterior Doors: Non-removable pins
  - d. Out-Swinging Interior Lockable Doors: Non-removable pins
  - e. Interior Non-lockable Doors: Non-rising pins

## 2.04 CONTINUOUS HINGES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

## 2.05 ELECTRIC POWER TRANSFER

### A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Von Duprin EPT-10-CON
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

## 2.06 DOOR CORDS

### A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Schlage 788/798 Series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide door cords with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

## 2.07 FLUSH BOLTS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

## 2.08 COORDINATORS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:

- a. Alternates by Substitution Request only

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

## 2.09 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage L9000 series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide indicator window measuring a minimum 2-inch x 1/2 inch with 180-degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
  - a. Lever Design: 06A

## 2.10 MORTISE LOCKS – NARROW STYLE

A. Manufacturer and Product:

1. Scheduled Manufacturer:
  - a. Accurate 8800 series
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide narrow style mortise locks conforming to ANSI/BHMA A156.13, Grade 1 Operational and manufactured from heavy gauge steel, containing components of steel with zinc dichromate plating for corrosion resistance. Cylinders: Refer to "KEYING" article, herein.
2. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
3. Lever Trim: Matching levers and roses or escutcheons from manufacturer of standard mortise locks. Provide all necessary fasteners, spindles, and parts to make complete functioning unit.

## 2.11 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage ND series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
  - a. Lever Design: Rhodes

## 2.12 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Von Duprin 98/35A series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide smooth touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.

4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Provide electrified options as scheduled.
13. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
14. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.
15. Special Options:
  - a. CDSI: Provide dogging indicators for visible indication of dogging status.
  - b. CVC: Concealed Vertical Cable Exit Devices: provide cable-actuated concealed vertical latch system in two-point for non-rated or fire rated wood doors up to a 90 minute rating and less bottom latch (LBL) configuration for non-rated or fire rated wood doors up to 20 minute rating. Vertical rods not permitted.
    - 1) Cable: Stainless steel with abrasive resistant coating. Conduit and core wire ends snap into latch and center slides without use of tools.
    - 2) Wood Door Prep: Maximum 1 inch x 1.1875 inch x 3.875 inches top latch pocket and 1 inch x 1.1875 inch x 5 inches bottom latch pocket which does not require the use of a metal wrap or edge for non-rated or fire rated wood doors up to a 45 minute rating.
    - 3) Latchbolts and Blocking Cams: Manufactured from sintered metal low carbon copper-infiltrated steel, with molybdenum disulfide low friction coating.
    - 4) Top Latchbolt: Minimum 0.38 inch (10 mm) and greater than 90<sup>-degree</sup> engagement with strike to prevent door and frame separation under high static load.
    - 5) Bottom Latchbolt: Minimum of 0.44-inch (11 mm) engagement with strike.
    - 6) Product Cycle Life: 1,000,000 cycles.
    - 7) Latch Operation: Top and bottom latch operate independently of each other. Top latch fully engages top strike even when bottom latch is compromised. Separate trigger mechanisms not permitted.
    - 8) Latch release does not require separate trigger mechanism.
    - 9) Cable and latching system characteristics:
      - a) Installed independently of exit device installation, and capable of functioning on door prior to device and trim installation.
      - b) Connected to exit device at single point in steel and aluminum doors, and two points for top and bottom latches in wood doors.
      - c) Bottom latch height adjusted, from single point for steel and aluminum doors and two points for wood doors, after system is installed and connected to exit device, while door is hanging
      - d) Bottom latch position altered up and down minimum of 2 inches (51 mm) in steel and aluminum doors without additional adjustment. Bottom latch deadlocks in every adjustment position in wood doors.
      - e) Top and bottom latches in steel and aluminum doors and top latch in wood doors may be removed while door is hanging.

## 2.13 ELECTRONIC ACCESS CONTROL LOCKSETS AND EXIT DEVICE TRIM

### A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Schlage AD Series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide adaptable electronic access control products that comply with the following requirements:
  - a. Listed, UL 294 - The Standard of Safety for Access Control System Units.
  - b. Compliant with ANSI/BHMA A156.25 Grade 1 Operation and Security.
  - c. Certified to UL10C, FCC Part15, Florida Building Code Standards TAS 201 large missile impact, TAS 202 and TAS 203.
  - d. Compliant with ASTM E330 for door assemblies.
  - e. Compliant with ICC / ANSI A117.1, NFPA 101, NFPA 80, and Industry Canada IC.
2. Functions: Provide functions as scheduled that are field configurable without taking the adaptable electronic product off the door.
3. Emergency Override: Provide mechanical key override; cylinders: Refer to "KEYING" article, herein.
4. Levers:
  - a. Vandal Resistance: Exterior (secure side) lever rotates freely while door remains locked, preventing damage to internal lock components from vandalism by excessive force.
  - b. Provide non-handed lever trim that operates independently of non-locking levers.
  - c. Style: Rhodes
5. Features:
  - a. Audible feedback that can be enabled or disabled.
  - b. Tamper-Resistant Screws: Tamper torx screws on inside escutcheon for increased security.
  - c. Visual tri-colored LED indicators that indicate activation, additional PIN code credential required, operational systems status, system error conditions and low power conditions.
  - d. Door Position Switch
  - e. Interior Cover Tamper Guard
  - f. Mechanical Key Override
  - g. Request to Exit
  - h. Request to Enter
  - i. Lock/Unlock Status
6. Credential Reader:
  - 1) Credential Reader Configuration: Provide credential reader modules in the configurations as indicated in door hardware sets.
  - 2) Credential Reader Capabilities: Provide credential readers capable of operating with the following integrated software partners.
    - a) 13.56 MHz Smart card credentials:
      - i. Secure section (Multi-Technology and Smartcard): Schlage MIFARE Classic, Schlage MIFARE DESFire EV1/EV3, PIV and PIV-I Compatible
      - ii. 13.56 MHz Serial number only (Multi-Technology and Smartcard): MIFARE, DESFire, HID iClass, MIFARE DESFire EV1/EV3

- iii. 125 kHz Proximity card credentials: Schlage, XceedID, HID, GE/CASI ProxLite and AWID.
- b) Multi-Technology readers that read both 13.56 MHz Smart Cards and 125 kHz Prox cards.
- c) Dual credential reading capabilities credential card or fob and PIN.
- d) 12 button keypad with backlit buttons.
- e) Magnetic Card Reader:
  - i. Full insertion or swipe reader capable of reading information along full length of magnetic stripe.
  - ii. Magnetic card triple track reader capable of reading tracks 1, 2 or 3 per configuration in field.

7. Operation:

- a. Networked – wireless
  - 1) Adaptable electronic access control product system interface.
  - 2) Adaptable electronic access control products to have real-time bidirectional communication between access control system and lock.
  - 3) Remote Commanding By Partner Integrated Access Control Network Software: Battery-powered lockset shall have “Wake on Radio” feature causing activation of remote, wireless access control devices, enabling activated devices to be configured, locked or unlocked from a centralized location within 10 seconds or less without user interface at the device.
  - 4) Local Commanding: Provide adaptable electronic access control product with the ability to be configured, locked or unlocked locally by handheld programming device, in real-time.
  - 5) When Utilized with Access Control Network Software with Remote Commanding Capability: Provide adaptable electronic access control product with the ability to be remotely locked down or unlocked within 10 seconds or less while battery powered without user interface at the device.
  - 6) Real-time response of battery powered device capable of being configured at door by handheld programming device and remotely by Partner integrated software.
  - 7) Upon Loss of Power to Device: Provide adaptable electronic access control product with the ability to manage access control offline in one of three methods below that can be configured in the field at device by handheld programming device and remotely by Partner integrated software:
    - a) Fail locked (secured)
    - b) Fail unlocked (unsecured)
    - c) Fail As-Is
  - 8) Upon Loss of Communication Between Device and Network: Provide adaptable electronic access control product with the ability to manage access control offline in one of four methods below that can be configured in the field at lockset by handheld programming device and remotely by Partner integrated software:
    - a) Fail locked (secured)
    - b) Fail unlocked (unsecured)
    - c) Fail As-Is
    - d) Fail to Degraded/cache mode utilizing cache memory with following selectable options:
      - i. Grant access up to the last 1,000 unique previously accepted User IDs.
      - ii. Grant access up to the last 1,000 unique previously accepted facility/site codes
      - iii. Remove from cache previously stored User IDs or facility/site codes that have not been presented to lock within the last 5 days.
  - 9) Provide adaptable electronic access control product with the ability to be configured at door by handheld programming device and remotely by Partner integrated software the length of time device is unlocked upon access grant.

- 10) Provide adaptable electronic access control product with the ability to communicate identifying information such as firmware versions, hardware versions, serial numbers, and manufacturing dates by handheld programming device and remotely by Partner integrated software.
- 11) Wireless Transmission:
  - a) Modulation: 900 MHz spread spectrum, direct sequence, 10 channels.
  - b) Encryption: AES-128-bit Key minimum.

#### C. Components

1. Provide Panel Interface for adaptable electronic access control products.
  - a. Product: Schlage PIM400-485 or PIM400-TD2 Panel Interface Module as required.
  - b. Product: Schlage PIM400-1501 Panel Interface Module.

### 2.14 ACCESS CONTROL READER

#### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage MTB Series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

#### B. Requirements:

1. Provide access control card readers manufactured by a global company who is a recognized leader in the production of access control devices. Card reader manufactured for non-access control applications are not acceptable.
2. Provide multi-technology contactless readers complying with ISO 14443.
3. Provide access control card readers capable of reading the following technologies:
  - a. CSN - DESFire® CSN, HID iCLASS® CSN, Inside Contactless PicoTag® CSN, ST Microelectronics® CSN, Texas Instruments Tag-It®, CSN, Phillips I-Code® CSN
  - b. 125 KHz proximity - Schlage® Proximity, HID® Proximity, GE/CASI® Proximity, AWID® Proximity, LenelProx®
  - c. 13.56 MHz Smart card - Schlage smart cards using MIFARE Classic® EV1/EV3, Schlage smart cards using MIFARE Plus®, Schlage smart cards using MIFARE® DESFire® EV1/EV3, Schlage smart cards using MIFARE® DESFire® EV2/EV3
  - d. 13.56 MHz NFC (mobile), 2.45 GHz Bluetooth (mobile) - Mobile means compatible with Bluetooth and NFC-enabled smartphones.

### 2.15 ELECTRIC STRIKES

#### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Von Duprin 6000 Series.
2. Acceptable Manufacturers and Products:



- a. Alternates by Substitution Request only

B. Requirements:

1. Provide electric strikes designed for use with type of locks shown at each opening.
2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
3. Where required, provide electric strikes UL Listed for fire doors and frames.
4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

## 2.16 MAGNETIC LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage M490 series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide magnetic locks certified to meet ANSI/BHMA A156.23 classification criteria including minimum holding force of 1,500lbs. Provide magnetic locks equipped with SPDT Magnetic Bond Sensing device, where specified, to monitor whether enough magnetic holding force exists to ensure adequate locking and SPDT Door Status Monitor device, where specified, to monitor whether door is open or closed. Provide bond sensors fully concealed within electromagnet to resist tampering or damage.
2. Provide magnetic locks certified to meet UL10C, and UL1034 for burglary-resistant electronic locking mechanisms.
3. Provide fasteners, mounting brackets, and spacer bars required for mounting and details.
4. Provide power supply recommended and approved by manufacturer of magnetic locks.
5. Where magnetic locks are scheduled, provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of magnetic locks for each individual leaf. Switches control both doors simultaneously at pairs. Locate controls as directed by Architect.

## 2.17 PASSIVE INFRARED MOTION SENSORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage SCAN II Series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide motion sensors as specified in hardware groups.

## 2.18 PUSHBUTTONS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage 620/631 Series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide push buttons as specified in hardware groups.

## 2.19 POWER SUPPLIES

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage/Von Duprin PS900 Series
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:
  - a. 12/24 VDC Output, field selectable.
  - b. Class 2 Rated power limited output.
  - c. Universal 120-240 VAC input.
  - d. Low voltage DC, regulated and filtered.
  - e. Polarized connector for distribution boards.
  - f. Fused primary input.
  - g. AC input and DC output monitoring circuit w/LED indicators.
  - h. Cover mounted AC Input indication.
  - i. Tested and certified to meet UL294.
  - j. NEMA 1 enclosure.
  - k. Hinged cover w/lock down screws.
  - l. High voltage protective cover.

## 2.20 CYLINDERS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage Everest 29 T
    - a) Field verification required. Match and integrate into existing facility key system.
2. Acceptable Manufacturers and Products:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
  - a. Conventional Patented Restricted: cylinder with interchangeable core with patented, restricted keyway.
3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

## 2.21 KEYING

### A. Scheduled System:

1. Existing factory registered system:
  - a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

### B. Requirements:

1. Construction Keying:
  - a. Replaceable Construction Cores.
    - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
      - a) 3 construction control keys
      - b) 12 construction change (day) keys.
    - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
2. Permanent Keying:
  - a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
    - 1) Master Keying system as directed by the Owner.

- b. Forward biting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
- c. Provide keys with the following features:
  - 1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
  - 2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
  - 3) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.
- d. Identification:
  - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
  - 2) Identification stamping provisions must be approved by the Architect and Owner.
  - 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
  - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
  - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
- e. Quantity: Furnish in the following quantities.
  - 1) Change (Day) Keys: 3 per cylinder/core.
  - 2) Permanent Control Keys: 3.
  - 3) Master Keys: 6.

## 2.22 KEY CONTROL SYSTEM

### A. Manufacturers:

- 1. Scheduled Manufacturer:
  - a. Telkee
- 2. Acceptable Manufacturers:
  - a. HPC
  - b. Lund

### B. Requirements:

- 1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
  - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
  - b. Provide hinged-panel type cabinet for wall mounting.

## 2.23 DOOR CLOSERS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
    - a. LCN 4040XP series
  2. Acceptable Manufacturers and Products:
    - a. Alternates by Substitution Request only
- B. Requirements:
1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
  2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
  3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
  4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
  5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
  6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
  7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
  8. Pressure Relief Valve (PRV) Technology: Not permitted.
  9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
  10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

## 2.24 DOOR TRIM

- A. Manufacturers:
1. Scheduled Manufacturer:
    - a. Ives.
  2. Acceptable Manufacturers:
    - a. Alternates by Substitution Request only
- B. Requirements:
1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

## 2.25 PROTECTION PLATES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Size plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

## 2.26 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

### A. Manufacturers:

1. Scheduled Manufacturers:
  - a. Glynn-Johnson
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
2. Provide friction type at doors without closer and positive type at doors with closer.

## 2.27 DOOR STOPS AND HOLDERS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

### B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.

2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

## 2.28 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Zero International
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

## 2.29 SILENCERS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

### B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

## 2.30 MAGNETIC HOLDERS

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. LCN

2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

## 2.31 DOOR POSITION SWITCHES

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Schlage
2. Acceptable Manufacturers:
  - a. Alternates by Substitution Request only

B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

## 2.32 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor



- construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
  - C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
  - D. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A. Where on-site modification of doors and frames is required:
  - 1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
  - 2. Field modify and prepare existing doors and frames for new hardware being installed.
  - 3. When modifications are exposed to view, use concealed fasteners, when possible.
  - 4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
    - a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
    - b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
    - c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

### 3.03 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
  - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  - 2. Custom Steel Doors and Frames: HMMA 831.
  - 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
  - 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
  - 1. Install construction cores to secure building and areas during construction period.
  - 2. Replace construction cores with permanent cores as indicated in keying section.
  - 3. Furnish permanent cores to Owner for installation.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
  - 1. Conduit, junction boxes and wire pulls.
  - 2. Connections to and from power supplies to electrified hardware.
  - 3. Connections to fire/smoke alarm system and smoke evacuation system.
  - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
  - 5. Connections to panel interface modules, controllers, and gateways.
  - 6. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

### 3.04 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
  2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

### 3.05 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

### 3.06 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

Hardware Group No. 1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE:	BORROWED LITE/CASED OPENING - NO HARDWARE REQUIRED	UNF	BYO

Hardware Group No. 2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06-SNB	626	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE: WHERE PROPER REINFORCEMENT IN THE FRAME IS NOT PRESENT	PROVIDE "RIV-NUT" TYPE FASTENERS TO ATTACH NEW HARDWARE TO EXISTING FRAME	UNF	MIS

NOTE: FIELD VERIFY EXISTING CONDITIONS FOR INSTALLATION OF NEW HARDWARE ON EXISTING FIRE RATED OPENING PRIOR TO BIDDING OR ORDERING MATERIAL. CONTRACTOR TO STRIKE DUPLICATE HARDWARE AFTER FIELD VERIFICATION AND COORDINATION WITH OWNER TO DETERMINE EXISTING HARDWARE ITEMS TO REMAIN.

NOTE: SECURE APPROVAL OF WIRING AND INSTALLATION DETAILING OF MAGNETIC HOLDERS FROM OWNER AND ARCHITECT PRIOR TO CONSTRUCTION. PROVIDE MAG HOLDER EXTENSIONS IF REQUIRED.

OPERATIONAL DESCRIPTION: DOOR NORMALLY HELD OPEN BY MAGNETIC HOLDER. MAGNETIC HOLDER SHALL BE CONNECTED TO BUILDING'S FIRE/SMOKE ALARM SYSTEM TO RELEASE IMMEDIATELY UPON ACTIVATION OF BUILDING'S FIRE/SMOKE ALARM SYSTEM ALLOWING DOOR TO SELF-CLOSE AND LATCH.

Hardware Group No. 3

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	DOOR CORD	798-18 LESS WIRES	626	SCE
1	EA	ELEC FIRE EXIT HARDWARE	98-L-F-M996-06-FS-CON-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	7766	628	SCE
1	EA	POWER SUPPLY	PS902 FA900 120/240 VAC	LGR	SCE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE: WHERE PROPER REINFORCEMENT IN THE FRAME IS NOT PRESENT	PROVIDE "RIV-NUT" TYPE FASTENERS TO ATTACH NEW HARDWARE TO EXISTING FRAME	UNF	MIS

NOTE: FIELD VERIFY EXISTING CONDITIONS FOR INSTALLATION OF NEW HARDWARE ON EXISTING FIRE RATED OPENING PRIOR TO BIDDING OR ORDERING MATERIAL. CONTRACTOR TO STRIKE DUPLICATE HARDWARE AFTER FIELD VERIFICATION AND COORDINATION WITH OWNER TO DETERMINE EXISTING HARDWARE ITEMS TO REMAIN.

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE MOTOR DRIVEN ELECTRIC LEVER TRIM (M996) ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. MOTOR DRIVEN ELECTRIC LEVER TRIM SHALL BE CONNECTED TO THE BUILDING'S FIRE/SMOKE ALARM SYSTEM AND SHALL IMMEDIATELY UNLOCK WITHOUT UNLATCHING UPON ACTIVATION OF THE BUILDING'S FIRE/SMOKE ALARM SYSTEM, LOSS OF POWER (FAIL-SAFE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.
3. REQUIRED WIRING FROM THE PS902 POWER SUPPLY TO THE FAIL-SAFE MOTOR DRIVEN M996 ELECTRIC LEVER TRIM.

Hardware Group No. 4

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE:	EXISTING DOOR, FRAME & HARDWARE TO REMAIN		EXI

Hardware Group No. 5

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE: WHERE EXISTING FLUSH LOUVER IS PRESENT	PROVIDE METAL PLATE TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 1" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE:	EXISTING DOOR, FRAME & HARDWARE TO REMAIN		EXI

Hardware Group No. 6

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	NOTE: WHERE EXISTING FRAMED LOUVER IS PRESENT	PROVIDE METAL PLATE ON EACH SIDE OF DOOR TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 2" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE:	EXISTING DOOR, FRAME & HARDWARE TO REMAIN		EXI

Hardware Group No. 7

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ELEC CLASSROOM LOCK	AD-400-CY-70-MT-RHO-J 4AA BATTERY	626	SCE
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

NOTE: AD-400 CYLINDRICAL LOCK IS TO BE TIED INTO THE EXISTING PROTECTION TECHNOLOGY ACCESS CONTROL SYSTEM. ALL PROGRAMMING, REQUIRED PIM'S, SET-UP AND TRAINING IS BY THE DIVISION 28 SUPPLIER.

Hardware Group No. 8

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ELEC CLASSROOM LOCK	AD-400-CY-70-MT-RHO-J 4AA BATTERY	626	SCE
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING FLUSH LOUVER IS PRESENT	PROVIDE METAL PLATE TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 1" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

NOTE: AD-400 CYLINDRICAL LOCK IS TO BE TIED INTO THE EXISTING PROTECTION TECHNOLOGY ACCESS CONTROL SYSTEM. ALL PROGRAMMING, REQUIRED PIM'S, SET-UP AND TRAINING IS BY THE DIVISION 28 SUPPLIER.



Hardware Group No. 9

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	FIRE EXIT HARDWARE	98-EO-F-SNB	626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-400-993R-70-MT-RHO-J 4AA	626	SCE
			BATTERY		
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

NOTE: AD-400 EXIT DEVICE TRIM IS TO BE TIED INTO THE EXISTING PROTECTION TECHNOLOGY ACCESS CONTROL SYSTEM. ALL PROGRAMMING, REQUIRED PIM'S, SET-UP AND TRAINING IS BY THE DIVISION 28 SUPPLIER.

Hardware Group No. 10

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING FLUSH LOUVER IS PRESENT	PROVIDE METAL PLATE TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 1" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

NOTE: INSTALL METAL COVER PLATE ON LEAST PUBLIC SIDE OF THE DOOR.

Hardware Group No. 11

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
2	EA	NOTE: WHERE EXISTING FRAMED LOUVER IS PRESENT	PROVIDE METAL PLATE ON EACH SIDE OF DOOR TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 2" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 12

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

NOTE: KEY ON PUSH SIDE.

Hardware Group No. 13

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 14

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	MAGNETIC LOCK	M490P TJ490 ATS/LED 12/24 VDC	628	SCE
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	PUSH BUTTON	623GIDEX DA 12/24 VDC	630	SCE
1	EA	DOOR CONTACT	7766	628	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE
1	EA	POWER SUPPLY	PS902 FA900 120/240 VAC	LGR	SCE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE: WHERE PROPER REINFORCEMENT IN THE FRAME IS NOT PRESENT	PROVIDE "RIV-NUT" TYPE FASTENERS TO ATTACH NEW HARDWARE TO EXISTING FRAME	UNF	MIS
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE MAGNETIC LOCK ALLOWING THE DOOR TO BE OPENED. IMMEDIATE EGRESS IS ALWAYS AVAILABLE USING THE MOTION SENSOR OR THE NON-FIRE RELATED EMERGENCY RELEASE BUTTON. DOOR POSITION MONITORED (DPS).

THE MAGNETIC LOCK IS TO BE TIED TO THE FIRE ALARM SYSTEM AND SHALL IMMEDIATELY UNLOCK UPON ACTIVATION OF THE FIRE ALARM SYSTEM OR LOSS OF POWER (FAIL-SAFE).

THE NON-FIRE RELATED EMERGENCY RELEASE BUTTON IS TO BE WIRED DIRECTLY BETWEEN THE POWER SUPPLY FOR THE MAGNETIC LOCK AND THE MAGNETIC LOCK ITSELF.

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, EMERGENCY RELEASE BUTTON, DOOR POSITION SWITCH AND THE MOTION SENSOR REQUEST-TO-EXIT SWITCH.
3. REQUIRED WIRING FROM THE PS902 POWER SUPPLY TO THE MAGNETIC LOCK.

Hardware Group No. 15

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	EXIT X BLANK OUTSIDE	ND25D RHO	626	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 16

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	INSTITUTION LOCK	ND82JD RHO	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 17

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ENTRANCE/OFFICE LOCK	ND50JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 18

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	NOTE: WHERE EXISTING FLUSH LOUVER IS PRESENT	PROVIDE METAL PLATE TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 1" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 19

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	STRIKE PLATE	AS REQUIRED FOR NEW LOCK TO FIT AND FUNCTION PROPERLY (ONLY REQ'D IF ASA STRIKE WON'T WORK)	626	MIS
1	EA	MORTISE LOCK EDGE FILLER	AS REQUIRED FOR NEW LOCK TO FIT AND FUNCTION PROPERLY	626	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 20

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 21

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PRIVACY LOCK	ND40S RHO	626	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 22

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STOREROOM LOCK	ND80JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING FLUSH LOUVER IS PRESENT	PROVIDE METAL PLATE TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 1" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI



Hardware Group No. 23

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STOREROOM LOCK	ND80JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
2	EA	NOTE: WHERE EXISTING FRAMED LOUVER IS PRESENT	PROVIDE METAL PLATE ON EACH SIDE OF DOOR TO COVER EXISTING LOUVER OPENING -PLATE SIZE TO BE 2" LARGER (ALL FOUR SIDES) THAN EXISTING LOUVER OPENING	630	IVE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 24

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	STOREROOM LOCK	ND80JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 25

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-98-NL-OP-110MD-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O	630-316	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE: WHERE PROPER REINFORCEMENT IN THE FRAME IS NOT PRESENT	PROVIDE "RIV-NUT" TYPE FASTENERS TO ATTACH NEW HARDWARE TO EXISTING FRAME	UNF	MIS

NOTE: FIELD VERIFY EXISTING CONDITIONS FOR INSTALLATION OF NEW HARDWARE ON EXISTING OPENING PRIOR TO BIDDING OR ORDERING MATERIAL. CONTRACTOR TO STRIKE DUPLICATE HARDWARE AFTER FIELD VERIFICATION AND COORDINATION WITH OWNER TO DETERMINE EXISTING HARDWARE ITEMS TO REMAIN.

Hardware Group No. 26

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE:	REMOVE EXISTING LOCKING HARDWARE & BLANK OFF EXISTING STRIKE & LATCHBOLT PREP	UNF	EXI
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

Hardware Group No. 27

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE:	FUTURE OPENING. NO HARDWARE REQUIRED.		MIS

Hardware Group No. 28

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA NOTE:	ALL HARDWARE BY DOOR SUPPLIER	UNF	B/O

Hardware Group No. 29

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA CONT. HINGE	112XY	628	IVE
1	EA NARROW STILE LOCK BODY	STOREROOM LOCK FUNCTION 8859	626	ACC
1	EA STOREROOM LOCK	L9080L 06A LLL LLL LESS LOCK CASE XL11-422	626	SCH
1	EA MORTISE CYLINDER	30-137 X L583-255 36-083 36-082-037	626	SCH
1	EA FSIC CORE	23-030 EV29 T	626	SCH
1	EA FSIC CORE	23-030 ICX	ORG	SCH
1	EA ELECTRIC STRIKE	6211AL FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA OH STOP	100S	630	GLY
1	EA SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA PA MOUNTING PLATE	4040XP-18PA SRT	689	LCN
1	EA BLADE STOP SPACER	4040XP-61 SRT	689	LCN
1	EA DOOR SWEEP	39A	A	ZER
1	EA THRESHOLD	625A-V3-223	A	ZER
1	EA WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA DOOR CONTACT	679-05HM	BLK	SCE

NOTE: PERIMETER WEATHERSTRIPPING BY ALUMINUM DOOR SUPPLIER.

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 30

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	NARROW STILE LOCK BODY	STOREROOM LOCK FUNCTION 8859	626	ACC
1	EA	STOREROOM LOCK	L9080L 06A LLL LLL LESS LOCK CASE XL11-422	626	SCH
1	EA	MORTISE CYLINDER	30-137 X L583-255 36-083 36-082-037	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211AL FSE DSLC CON 12/16/24/28 VAC/VDC	630	VON
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA SRT	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 SRT	689	LCN
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	625A-V3-223	A	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE

NOTE: PERIMETER WEATHERSTRIPPING BY ALUMINUM DOOR SUPPLIER.

OPERATIONAL DESCRIPTION: SCHEDULED LOCKING/UNLOCKING OF ELECTRIC STRIKE BY ACCESS CONTROL SYSTEM. NO CREDENTIAL READER ACCESS. REMOTE RELEASE OF ELECTRIC STRIKE FROM CENTRAL CONTROL IS ALSO AVAILABLE.

BUSINESS HOURS:

SCHEDULED UNLOCKING OF ELECTRIC STRIKE BY ACCESS CONTROL SYSTEM TO ALLOW INGRESS. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. REQUEST-TO-EXIT MOTION SENSOR WILL INDICATE AUTHORIZED EGRESS. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM SYSTEM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS). DS-LC LATCH BOLT MONITOR SWITCH INSIDE THE ELECTRIC STRIKE WILL INDICATE IF THE DOOR IS LATCHED OR NOT.

NON-BUSINESS HOURS:

SCHEDULED LOCKING OF ELECTRIC STRIKE BY ACCESS CONTROL SYSTEM. INGRESS BY KEY ONLY, NO CREDENTIAL READER ACCESS. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. REQUEST-TO-EXIT MOTION SENSOR WILL INDICATE AUTHORIZED EGRESS. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM SYSTEM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS). DS-LC LATCH BOLT MONITOR SWITCH INSIDE THE ELECTRIC STRIKE WILL INDICATE IF THE DOOR IS LATCHED OR NOT.

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. NO CREDENTIAL READER/S.
2. REQUIRED POWER AND WIRING TO THE REQUEST-TO-EXIT MOTION SENSOR, DOOR POSITION SWITCH, ELECTRIC STRIKE AND THE DS-LC LATCH BOLT MONITOR SWITCH INSIDE THE ELECTRIC STRIKE ITSELF.

Hardware Group No. 31

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	35A-L-NL-360-06	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	PA MOUNTING PLATE	4040XP-18PA SRT	689	LCN
1	EA	BLADE STOP SPACER	4040XP-61 SRT	689	LCN
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	625A-V3-223	A	ZER
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

NOTE: PERIMETER WEATHERSTRIPPING BY ALUMINUM DOOR SUPPLIER.

OPERATIONAL DESCRIPTION: DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. REQUIRED WIRING AND POWER TO THE DOOR POSITION SWITCH.

Hardware Group No. 32

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06-SNB	626	VON
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE: WHERE PROPER REINFORCEMENT IN THE FRAME IS NOT PRESENT	PROVIDE "RIV-NUT" TYPE FASTENERS TO ATTACH NEW HARDWARE TO EXISTING FRAME	UNF	MIS

NOTE: FIELD VERIFY EXISTING CONDITIONS FOR INSTALLATION OF NEW HARDWARE ON EXISTING FIRE RATED OPENING PRIOR TO BIDDING OR ORDERING MATERIAL. CONTRACTOR TO STRIKE DUPLICATE HARDWARE AFTER FIELD VERIFICATION AND COORDINATION WITH OWNER TO DETERMINE EXISTING HARDWARE ITEMS TO REMAIN.

NOTE: SECURE APPROVAL OF WIRING AND INSTALLATION DETAILING OF MAGNETIC HOLDERS FROM OWNER AND ARCHITECT PRIOR TO CONSTRUCTION. PROVIDE MAG HOLDER EXTENSIONS IF REQUIRED.

OPERATIONAL DESCRIPTION: DOOR NORMALLY HELD OPEN BY MAGNETIC HOLDER. MAGNETIC HOLDER SHALL BE CONNECTED TO BUILDING'S FIRE/SMOKE ALARM SYSTEM TO RELEASE IMMEDIATELY UPON ACTIVATION OF BUILDING'S FIRE/SMOKE ALARM SYSTEM ALLOWING DOOR TO SELF-CLOSE AND LATCH.

Hardware Group No. 33

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	MAGNETIC LOCK	M490P TJ490 ATS/LED 12/24 VDC	628	SCE
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	PUSH BUTTON	623GIDEX DA 12/24 VDC	630	SCE
1	EA	DOOR CONTACT	7766	628	SCE
1	EA	MOTION SENSOR	SCANII 12/24 VDC	BLK	SCE
1	EA	POWER SUPPLY	PS902 FA900 120/240 VAC	LGR	SCE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	EXISTING DOOR & FRAME TO REMAIN	UNF	EXI
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE: WHERE PROPER REINFORCEMENT IN THE FRAME IS NOT PRESENT	PROVIDE "RIV-NUT" TYPE FASTENERS TO ATTACH NEW HARDWARE TO EXISTING FRAME	UNF	MIS
1	EA	NOTE:	REUSE BALANCE OF EXISTING HARDWARE	UNF	EXI

PULL SIDE CREDENTIAL READER, AND PUSH SIDE PUSH BUTTON AND MOTION RX.

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE MAGNETIC LOCK ALLOWING THE DOOR TO BE OPENED. IMMEDIATE EGRESS IS ALWAYS AVAILABLE USING THE MOTION SENSOR OR THE NON-FIRE RELATED EMERGENCY RELEASE BUTTON. DOOR POSITION MONITORED (DPS).

THE MAGNETIC LOCK IS TO BE TIED TO THE FIRE ALARM SYSTEM AND SHALL IMMEDIATELY UNLOCK UPON ACTIVATION OF THE FIRE ALARM SYSTEM OR LOSS OF POWER (FAIL-SAFE).

THE NON-FIRE RELATED EMERGENCY RELEASE BUTTON ON THE PUSH SIDE OF THE OPENING IS TO BE WIRED DIRECTLY BETWEEN THE POWER SUPPLY FOR THE MAGNETIC LOCK AND THE MAGNETIC LOCK ITSELF.

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, EMERGENCY RELEASE BUTTON, DOOR POSITION SWITCH AND THE MOTION SENSOR REQUEST-TO-EXIT SWITCH.
3. REQUIRED WIRING FROM THE PS902 POWER SUPPLY TO THE MAGNETIC LOCK.

Hardware Group No. 34

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	LX-LC-98-EO-ALK-CON-SNB 9-VOLT BATTERY WITH HARDWIRED OPTION	626	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS-FA 120/240 VAC	LGR	SCE

NOTE: COORDINATE POWER SUPPLY WITH SECURITY PRIOR TO SUBMITTAL. OMIT WHERE PROVIDED BY SECURITY.

OPERATIONAL DESCRIPTION: OPENING TO BE MONITORED AND ARMED ONLY. NO AUTHORIZED EGRESS AVAILABLE. OPENING THE DOOR FROM THE EGRESS SIDE WILL SOUND AN AUDIBLE ALARM AND ACCESS CONTROL SYSTEM WILL PROVIDE AN ALERT. ALARM RESET BY KEY AT PANIC DEVICE OR BY ACCESS CONTROL SYSTEM. IMMEDIATE ARMED EGRESS IS ALWAYS AVAILABLE. KEYED INGRESS IS NOT AVAILABLE. DOOR POSITION MONITORED (DPS). LATCH BOLT MONITORED (LX-LC).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. NO CREDENTIAL READER/S.
2. REQUIRED POWER AND WIRING TO THE LX-LC SWITCH AND ALK ALARM IN THE PANIC HARDWARE AND THE DOOR POSITION SWITCH.



Hardware Group No. 35

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	98-L-F-M996-06-FS-CON-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	POWER SUPPLY	PS902 FA900 120/240 VAC	LGR	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE MOTOR DRIVEN ELECTRIC LEVER TRIM (M996) ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. MOTOR DRIVEN ELECTRIC LEVER TRIM SHALL BE CONNECTED TO THE BUILDING'S FIRE/SMOKE ALARM SYSTEM AND SHALL IMMEDIATELY UNLOCK WITHOUT UNLATCHING UPON ACTIVATION OF THE BUILDING'S FIRE/SMOKE ALARM SYSTEM, LOSS OF POWER (FAIL-SAFE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.
3. REQUIRED WIRING FROM THE PS902 POWER SUPPLY TO THE FAIL-SAFE MOTOR DRIVEN M996 ELECTRIC LEVER TRIM.

Hardware Group No. 36

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 37

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM W/DEADBOLT	L9480J 06A L583-363 L283-722 XL11-422	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6216 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	626	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE WILL RELEASE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. OCCUPANT THROWS INTERIOR DEADBOLT FOR PRIVACY, EXTERIOR OCCUPIED INDICATOR IS THEN DISPLAYED. INSIDE LEVER RETRACTS LATCH AND DEADBOLT FOR SINGLE MOTION EGRESS. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. DOOR REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, ELECTRIC STRIKE AND DOOR POSITION SWITCH.

Hardware Group No. 38

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	DBL CYL STORE LOCK	ND66JD RHO	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
2	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON EITHER SIDE OF THE OPENING IS TO RELEASE THE ELECTRIC STRIKE AND SHUNT ANY ALARM ASSOCIATED WITH THE DOOR POSITION SWITCH ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS/EGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS NOT AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICES.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICES, ELECTRIC STRIKE AND THE DOOR POSITION SWITCH.

Hardware Group No. 39

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
2	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE, OR ACTIVATING EITHER OF THE DESK MOUNTED REMOTE RELEASE BUTTONS, IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, DESK MOUNTED REMOTE RELEASE BUTTONS AND THE DOOR POSITION SWITCH.

Hardware Group No. 40

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 41

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 42

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.



Hardware Group No. 43

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	7766	628	SCE
1	EA	NOTE: WHERE EXISTING DOOR & FRAME PREP IS PRESENT	PROVIDE DOOR AND FRAME FILLER PLATES AS REQUIRED FOR NEW HARDWARE TO FIT AND FUNCTION PROPERLY	UNF	MIS
1	EA	NOTE:	FIELD VERIFICATION REQUIRED TO ENSURE THAT NEW HARDWARE WILL WORK PROPERLY WITH EXISTING OPENING	UNF	BYO
1	EA	NOTE: WHERE PROPER REINFORCEMENT IN THE FRAME IS NOT PRESENT	PROVIDE "RIV-NUT" TYPE FASTENERS TO ATTACH NEW HARDWARE TO EXISTING FRAME	UNF	MIS

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, ELECTRIC STRIKE AND THE DOOR POSITION SWITCH.

Hardware Group No. 44

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 45

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 46

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	SET	GASKETING	328AA-S	AA	ZER
1	EA	MOUNTING BRACKET	328SPB		ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

NOTE: 328A IS TO BE USED AS HEAD AND JAMB SEALS.

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 47

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE, OR ACTIVATING THE DESK MOUNTED REMOTE RELEASE BUTTON IN ADMIN C2220, IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, DESK MOUNTED REMOTE RELEASE BUTTON AND THE DOOR POSITION SWITCH.

Hardware Group No. 48

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 49

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE, OR ACTIVATING THE DESK MOUNTED REMOTE RELEASE BUTTON, IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, DESK MOUNTED REMOTE RELEASE BUTTON AND THE DOOR POSITION SWITCH.

Hardware Group No. 50

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE, OR ACTIVATING THE DESK MOUNTED REMOTE RELEASE BUTTON, IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, DESK MOUNTED REMOTE RELEASE BUTTON AND THE DOOR POSITION SWITCH.



Hardware Group No. 51

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 52

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE, OR ACTIVATING THE DESK MOUNTED REMOTE RELEASE BUTTON, IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, DESK MOUNTED REMOTE RELEASE BUTTON AND THE DOOR POSITION SWITCH.

Hardware Group No. 53

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	SET	GASKETING	328AA-S	AA	ZER
1	EA	MOUNTING BRACKET	328SPB		ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

NOTE: 328A IS TO BE USED AS HEAD AND JAMB SEALS.

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 54

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 55

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PUSH SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, ELECTRIC STRIKE AND THE DOOR POSITION SWITCH.

Hardware Group No. 56

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 57

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE, OR ACTIVATING THE DESK MOUNTED REMOTE RELEASE BUTTON, IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE, DESK MOUNTED REMOTE RELEASE BUTTON AND THE DOOR POSITION SWITCH.

Hardware Group No. 58

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD-98-L-NL-06-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.



Hardware Group No. 59

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	LD-98-L-NL-06-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 60

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	GASKETING	328AA-S	AA	ZER
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	566A-V3-223	A	ZER

NOTE: MOUNT 429A HEAD SEAL PRIOR TO MOUNTING CLOSER. 328A IS TO BE USED AS JAMB SEALS.

Hardware Group No. 61

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8305 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 62

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8305 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 63

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8305 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 64

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 65

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 66

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	OH STOP & HOLDER	450F	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 67

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 68

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	SURFACE CLOSER	4040XP H TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 69

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 70

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363 L283-722	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 71

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 72

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 73

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363 L283-722	626	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 74

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	PRIVACY LOCK	L9040 06A L583-363 L283-722	630	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 75

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050J 06A L583-363 L283-722	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 76

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050J 06A L583-363	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

NOTE: KEY ON PULL SIDE.

Hardware Group No. 77

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050J 06A L583-363 L283-722	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 78

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050J 06A L583-363 L283-722	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 79

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050J 06A L583-363 L283-722	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 80

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-06-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 81

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	SET	GASKETING	328AA-S	AA	ZER
1	EA	DOOR BOTTOM	367AA	AA	ZER
1	EA	MOUNTING BRACKET	328SPB		ZER

Hardware Group No. 82

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 83

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 84

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	SET	GASKETING	328AA-S	AA	ZER
1	EA	DOOR BOTTOM	367AA	AA	ZER
1	EA	MOUNTING BRACKET	328SPB		ZER

Hardware Group No. 85

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 86

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP & HOLDER	90F	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 87

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP H TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER



Hardware Group No. 88

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 89

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES AS REQ (12/24/120V AC/DC TRI-VOLT)	689	LCN
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

NOTE: SECURE APPROVAL OF WIRING AND INSTALLATION DETAILING OF MAGNETIC HOLDERS FROM OWNER AND ARCHITECT PRIOR TO CONSTRUCTION. PROVIDE MAG HOLDER EXTENSIONS IF REQUIRED.

OPERATIONAL DESCRIPTION: DOOR NORMALLY HELD OPEN BY MAGNETIC HOLDER. MAGNETIC HOLDER SHALL BE CONNECTED TO BUILDING'S FIRE/SMOKE ALARM SYSTEM TO RELEASE IMMEDIATELY UPON ACTIVATION OF BUILDING'S FIRE/SMOKE ALARM SYSTEM ALLOWING DOOR TO SELF-CLOSE AND LATCH.

Hardware Group No. 90

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	POWER TRANSFER	EPT10CON	689	VON
1	EA	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	ELECTRIC STRIKE	6223 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP SHCUSH TBSRT	689	LCN
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS	630	IVE
1	EA	OVERLAPPING ASTRAGAL	322A-S	A	ZER
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
2	EA	WIRE HARNESS	CON (VERIFY LENGTH AND QUANTITY REQUIRED)		SCH
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
2	EA	DOOR CONTACT	679-05HM	BLK	SCE

NOTE: 322A IS TO BE USED AS AN OVERLAPPING ASTRAGAL.

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE ON PULL SIDE OF OPENING IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 91

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CLASSROOM LOCK	L9070J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP SHCUSH TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	OVERLAPPING ASTRAGAL	322A-S	A	ZER
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

NOTE: 322A IS TO BE USED AS AN OVERLAPPING ASTRAGAL.

Hardware Group No. 92

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-NL-F-06-SNB	626	VON
1	EA	RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 93

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 94

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 95

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP & HOLDER	90F J	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 96

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP & HOLDER	90F	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 97

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 98

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 99

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP H TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 100

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	MANUAL FLUSH BOLT	FB458	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 101

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-98-NL-OP-110MD-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O	630-316	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 102

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-98-NL-OP-110MD-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O	630-316	IVE
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MTB11/MTB15 BY DIV. 28	BLK	SCE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

OPERATIONAL DESCRIPTION: PRESENTING VALID CREDENTIAL AT CREDENTIAL READER DEVICE IS TO RELEASE THE ELECTRIC STRIKE ALLOWING THE DOOR TO BE OPENED. KEYED INGRESS IS ALSO AVAILABLE. IMMEDIATE EGRESS IS ALWAYS AVAILABLE. ELECTRIC STRIKE REMAINS LOCKED UPON ACTIVATION OF FIRE ALARM OR LOSS OF POWER (FAIL-SECURE). DOOR POSITION MONITORED (DPS).

ITEMS TO BE PROVIDED BY THE DIVISION 28 SUPPLIER:

1. CREDENTIAL READER DEVICE.
2. REQUIRED POWER AND WIRING TO THE CREDENTIAL READER DEVICE AND THE DOOR POSITION SWITCH.

Hardware Group No. 103

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-98-L-NL-06-SNB	626	VON
1	EA	MORTISE CYL TURN	09-900 114 XB11-720 36-083	626	SCH
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 104

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-98-NL-OP-110MD-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O	630-316	IVE
1	EA	SURFACE CLOSER	4040XP HEDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 105

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-98-NL-OP-110MD-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O	630-316	IVE
1	EA	SURFACE CLOSER	4040XP SHCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 106

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-98-L-NL-06-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
1	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	SURFACE CLOSER	4040XP HEDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 107

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CDSI-9849-EO-LBL-SNB	626	VON
1	EA	PANIC HARDWARE	CDSI-9849-NL-OP-110MD-LBL-SNB	626	VON
1	EA	RIM HOUSING	20-079	626	SCH
2	EA	MORTISE CYLINDER	26-094 X XQ11-948 36-083 36-082-037	626	SCH
3	EA	FSIC CORE	23-030 EV29 T	626	SCH
3	EA	FSIC CORE	23-030 ICX	ORG	SCH
2	EA	90 DEG OFFSET PULL	8190EZHD 10" O	630-316	IVE
2	EA	SURFACE CLOSER	4040XP HEDA TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	WALL STOP	WS406/407CVX	630	IVE
1	SET	MEETING STILE	328AA-S	AA	ZER
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 108

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	DBL CYL STORE W/DB	L9466J 06A	626	SCH
2	EA	FSIC CORE	23-030 EV29 T	626	SCH
2	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER



Hardware Group No. 109

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	ROLLER LATCH	RL32	626	IVE
1	EA	FULL DUMMY TRIM	L0172 06A	626	SCH
2	EA	OH STOP & HOLDER	450F	630	GLY
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 110

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	OVERLAPPING ASTRAGAL	322A-S	A	ZER
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

NOTE: 322A IS TO BE USED AS AN OVERLAPPING ASTRAGAL.

Hardware Group No. 111

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080J 06A	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRACKET	MB	689	IVE
1	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP TBSRT	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	EA	OVERLAPPING ASTRAGAL	322A-S	A	ZER
1	EA	GASKETING	488SBK PSA H & J (PROVIDE SILENCERS AT NON-RATED DOORS)	BK	ZER

NOTE: 322A IS TO BE USED AS AN OVERLAPPING ASTRAGAL.

Hardware Group No. 112

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	OFFICE/ENTRY LOCK	L9050J 06A L583-363 L283-722	626	SCH
1	EA	FSIC CORE	23-030 EV29 T	626	SCH
1	EA	FSIC CORE	23-030 ICX	ORG	SCH
1	EA	WALL STOP	WS406/407CVX	630	IVE
1	SET	GASKETING	328AA-S	AA	ZER

NOTE: 328A IS TO BE USED AS HEAD AND JAMB SEALS.

**END OF SECTION**

## **SECTION 08 71 63 - DETENTION DOOR HARDWARE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes detention door hardware for the following:
  - 1. Swinging detention doors.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for general requirements for detention work.
  - 2. Section 05 05 53 "Security Metal Fasteners."
  - 3. Section 08 34 63 "Detention Doors and Frames."
  - 4. Section 08 88 53 "Security Glazing."
  - 5. Division 26: Electrical, Conduit.
  - 6. Division 28: Electronic Safety and Security.

#### **1.3 COORDINATION**

- A. Templates: Obtain and distribute, to the parties involved, templates for detention doors, frames, and other work specified to be factory prepared for installing detention door hardware.
- B. Electrical System Roughing-In: Coordinate layout and installation of electrically powered detention door hardware with connections to power supplies detention monitoring and control system fire-alarm system and detection devices and building control system.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Detention Keying Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." In addition to Owner, Contractor, and Architect, conference participants shall also include Detention Equipment Contractor and Installer. Incorporate detention keying conference decisions into Project's final Detention Keying Schedule after reviewing detention door hardware keying system including, but not limited to, the following:
  - 1. Preliminary key system schematic diagram.
  - 2. Requirements for key-control system.
  - 3. Requirements for access control.
- B. Preinstallation Conference: Conduct conference at Project site. Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Notify Owner and Architect of scheduled meeting dates.
  - 1. Inspect and discuss power and control system roughing-in and other preparatory work performed by other trades.
  - 2. Review sequence of operation for each type of detention door hardware.
  - 3. Review and finalize a construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Certifying procedures.

## 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of detention door hardware.
- B. Shop Drawings: For each type of detention door hardware.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Include diagrams for power, signal, and control wiring; differentiate between manufacturer-installed and field-installed wiring for detention door hardware. Include the following:
    - a. System schematic.
    - b. Point-to-point wiring diagram, including location of connections.
    - c. Riser diagram.
    - d. Elevation of each detention door type.
  - 3. Detail interface between electrically powered detention door hardware and detention monitoring and control fire-alarm and building control system.
- C. Detention Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware as well as installation procedures and wiring diagrams. Coordinate the Detention Door Hardware Schedule with detention doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of detention door hardware.
  - 1. Integrate detention door hardware indicated in "Detention Door Hardware Schedule" Article into Project's final Detention Door Hardware Schedule, and indicate complete designations of every item required for each detention door and opening.
  - 2. Keying Schedule: Coordinate detention keying with other door hardware in Project's final Keying Schedule.
  - 3. Indicate each detention lock and type of key cylinder using the following prefixes: "P" for paracentric, "M" for mogul, "HS" for high security, and "C" for commercial.
  - 4. Indicate security level of each item.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and supplier.
- B. Product Certificates: For each type of detention door hardware.
  - 1. Certify that detention door hardware complies with listed fire door assemblies.
- C. Product Test Reports: For each type of detention lock and latch security door closer and sliding detention door device, for tests performed by manufacturer and witnessed by a qualified testing agency or an independent, qualified testing agency.
- D. Examination reports documenting inspections of substrates, areas, and conditions.
- E. Anchor inspection reports documenting inspections of built-in and cast-in anchors.
- F. Field quality-control reports documenting inspections of installed products.
  - 1. Field quality-control certification signed by Construction Manager and Detention Equipment Contractor.
- G. Sample Warranties: For special warranties.

## 1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For detention door hardware to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
  - a. Normal remote security operation.
  - b. Normal local security operation.
  - c. Emergency security operation.

#### 1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of detention door hardware.
- B. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of detention door hardware Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper detention door hardware operation. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.
- C. Furnish the following:
  1. Include complete listing of spare parts (with re-order part numbers and re-order procedures), a list of contact persons (including addresses, phone numbers) for both routine and emergency advise, and a schedule for all maintenance activities required for each detention door hardware item.
  2. Include graphic and narrative descriptions of all products and equipment defining parts and their assembly; function; trouble-shooting situations and repair options, maintenance, replacement, and adjustment instructions.

#### 1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and an authorized representative of detention door hardware manufacturer for installation and maintenance of units required for this Project.
  1. Submit evidence of minimum five (5) years' experience in the installation of detention equipment. Provide a list of ten (10) projects of equivalent size or larger, giving the names, locations and architects.
  2. Submit a letter from manufacturer of detention locks and door operating devices stating that Installer is factory-trained, fully authorized and qualified to install their products specifically for this Project
- B. Supplier Qualifications: Detention door hardware supplier with warehousing facilities in Project's vicinity who is, or employs, a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about detention door hardware and keying.
  1. Detention Door Hardware Supplier Qualifications: An experienced detention door hardware supplier who has completed projects with electrically powered detention door hardware similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who is acceptable to manufacturer of primary materials.
    - a. Engineering Responsibility: Prepare data for electrically powered detention door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
    - b. Scheduling Responsibility: Preparation of Detention Door Hardware and Keying schedules.

- C. Architectural Openings Consultant Qualifications: A person who is currently certified by DHI as an Architectural Openings Consultant (AOC) and who is experienced in providing consulting services for detention door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
  - D. Source Limitations: Obtain door locks, sliding devices, operators, controls, and associated detention equipment from same manufacturer.
  - E. Qualifications for Welding: Qualify welding processes and welding operators in accord with AWS "Standard Qualification Procedure".
    - 1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests within previous twelve months. If recertification of welders is required, retesting will be Contractor's responsibility.
- 1.10 DELIVERY, STORAGE, AND HANDLING
- A. Inventory detention door hardware on receipt and provide secure lockup for detention door hardware delivered to Project site.
  - B. Tag each item or package separately with identification related to the Detention Door Hardware Schedule, and include basic installation instructions with each item or package.
  - C. Deliver detention door keys to Owner by registered mail or overnight package service.
- 1.11 WARRANTY
- A. Special Warranty: Manufacturer agrees to repair or replace components of detention door hardware that fail in materials or workmanship within specified warranty period.
    - 1. Failures include, but are not limited to, the following:
      - a. Structural failures including excessive deflection, cracking, or breakage.
      - b. Faulty operation of operators and detention door hardware.
      - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering or detention use.
    - 2. Warranty Period: Three years from date of Substantial Completion.
    - 3. Warranty Period for Continuous-Pin Detention Hinges: 10 years from date of Substantial Completion.
    - 4. Warranty Period for Security Door Closers: 10 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Swinging Detention Door Assemblies: Provide detention door hardware as part of a detention door assembly that complies with security grade indicated, when tested according to ASTM F 1450, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.

### **2.2 DETENTION DOOR HARDWARE, GENERAL**

- A. Provide detention door hardware for each door as scheduled in "Detention Door Hardware Schedule" Article to comply with requirements in this Section.
  - 1. Detention Door Hardware Sets: Provide quantity, item, size, finish, or color indicated.
  - 2. Sequence of Operation: Provide electrically powered detention door hardware function, sequence of operation, and interface with other building control systems indicated.
- B. Electrically Powered Detention Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

- C. Detention Door Hardware Control and Monitoring: Provide detention door hardware with features, functions, and internal equipment required to perform control and monitoring functions indicated in Section 28 46 03 "Door Control and Monitoring Systems."
  - D. Source Limitations: Obtain mechanical detention door hardware from same manufacturer as that of electrically powered or pneumatic detention door hardware.
  - E. Regulatory Requirements:
    - 1. Fire-Rated Detention Door Assemblies: Provide detention door hardware for assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
    - 2. Where indicated to comply with accessibility requirements, comply with local authorities having jurisdiction.
- 2.3 KEYS AND KEYING
- A. The contractor of this Section shall meet with the Owner and Architect to determine final keying requirements. Each key shall be individually stamped in accord with the following designations or any changes in designation provided during the keying meeting.
  - B. Coordinate with Owner to match keying to existing key system.
- 2.4 DETENTION HINGES
- A. Standard for Electric Detention Hinges: UL 634.
  - B. Mortise Detention Hinges: ANSI A156.7 Grade 1, 0.188-inch stainless steel, detention fastener mounted, ASI A156.7 template Mortise hinge with anti-friction bearing, hospital tips and integral anti-shear studs.
    - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Southern Folger Detention Equipment Company.
    - 2. Leaves: Drilled for countersunk security fasteners.
    - 3. Size: Minimum 4 1/2 by 4 1/2 by 0.200 inch.
    - 4. Security Grade: 1 according to ASTM F 1758.
    - 5. Finish: BHMA 630.
  - C. Utility-Door Detention Hinges: Heavy weight, plain bearing; fabricated from cast iron or steel; 3/8-inch- diameter, case-hardened, fully welded, steel hinge pin; full surface.
    - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Southern Folger Detention Equipment Company.
    - 2. Leaves: Solid.
    - 3. Size: Minimum 3 by 4 by 0.200 inch.
    - 4. Security Grade: 1 according to ASTM F 1758.
    - 5. Finish: BHMA 600.
  - D. Food-Pass Detention Hinges: Heavy weight, plain bearing; fabricated from cast iron or steel; 3/8-inch- diameter, case-hardened, fully welded, steel hinge pin; with applied stop preventing door from opening more than 90 degrees and supporting door in horizontal position as a shelf; full surface.
    - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. Southern Folger Detention Equipment Company.
    - 2. Leaves: Solid.
    - 3. Size: Minimum 3 by 4 by 0.200 inch.

4. Security Grade: 1 according to ASTM F 1758.
  5. Finish: BHMA 600.
- E. Full-Surface Detention Hinges: Extra heavy weight; two heavy-duty thrust bearings with hardened-steel ball bearings; fabricated from steel plate; 3/4-inch- diameter, case-hardened, fully welded, steel hinge pin.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Leaves: Drilled for countersunk security fasteners.
  3. Size: Minimum 5 by 5-1/4 by 1/2 inch.
  4. Security Grade: 1 according to ASTM F 1758.
  5. Finish: BHMA 600.
- 2.5 MECHANICAL DETENTION LOCKS AND LATCHES
- A. Lock Mountings:
1. Hollow-Metal Detention Doors: Mount detention lock to back of 0.179-inch nominal-thickness steel cover plate for installation in lock pocket fabricated into detention door. Attach cover plate to hollow-metal detention door with security fasteners.
- B. Utility-Door Mechanical Deadlocks, Paracentric Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Lockbolt retracted and extended by five -tumbler paracentric cylinder; keyed one side.
  3. Lockbolt: 1-1/2 inches high by 3/4 inch thick; 5/8-inch throw.
  4. Security Grade: 1 according to ASTM F 1577.
- C. Utility-Door Mechanical Deadlocks, Mogul Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Lockbolt retracted and extended by mogul cylinder; keyed one side.
  3. Lockbolt: 1-1/2 inches high by 3/4 inch thick; 5/8-inch throw.
  4. Security Grade: 1 according to ASTM F 1577.
- D. Utility-Door Mechanical Snaplatches, Paracentric Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Automatic snaplatch when door is closed; latchbolt retracted by five -tumbler paracentric cylinder; keyed one side.
  3. Latchbolt: 1 inch high by 7/16 inch thick; 5/16-inch throw.
  4. Security Grade: 1 according to ASTM F 1577.
- E. Utility-Door Mechanical Snaplatches, Mogul Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Automatic snaplatch when door is closed; latchbolt retracted by mogul cylinder; keyed one side.
  3. Latchbolt: 1 inch high by 7/16 inch thick; 5/16-inch throw.



4. Security Grade: 1 according to ASTM F 1577.
- F. Mechanical Snaplatches, Paracentric Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Automatic snaplatch when door is closed (slam locking); latchbolt retracted by half turn and extended by full turn in opposite direction of five -tumbler paracentric cylinder; keyed one side.
  3. Latchbolt: 2-inch-high by 3/4-inch- thick steel, with two case-hardened-steel insert pins; 3/4-inch throw; 1/2-inch bolt projection when retracted.
  4. Listed and labeled for use on fire doors.
  5. Security Grade: 1 according to ASTM F 1577.
- G. Mechanical Mortise Lock and Latch:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Variety of function to meet specific door requirements.
  3. Latchbolt: 1 1/8-inch-high by 3/4-inch- thick stainless steel, with 3/4-inch throw.
  4. Deadbolt: 1 1/4-inch-high by 3/4-inch-thick stainless steel with 1-inch throw.
  5. Security Grade: 1 according to ASTM F 1577.
- 2.6 ELECTROMECHANICAL DETENTION LOCKS AND LATCHES
- A. Connectors: Provide electromechanical detention locks and latches with factory-wired plug connector with 6-inch wire pigtail.
1. Provide security ring for installation of electromechanical detention lock in hollow-metal detention frame, welded to frame or access cover.
  2. Equip direct-current, solenoid-operated detention locks and latches with diode transient voltage protection at each locking device.
- B. Solenoid-Operated Deadlatches, Mogul Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Remote switch activates electric solenoid that retracts latchbolt; automatic latching and deadlocking when door is closed (slam locking). Latchbolt can be mechanically retracted by mogul cylinder; keyed one side or two sides.
    - a. Latchback: Latchbolt remains retracted until door is opened 2 inches, then releases.
    - b. If power fails, latchbolt automatically deadlocks (fail secure).
  3. Latchbolt: 1-1/2-inch-high by 3/4-inch- thick hardened steel; 1-inch throw.
  4. Provide internal deadlock indicator switch.
  5. Provide roller-type deadlock actuator.
  6. Voltage: 120-V ac.
  7. Listed and labeled for use on fire doors.
  8. Security Grade: 1 according to ASTM F 1577.
- C. Motor-Operated Deadlatches, Mogul Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.

2. Function: Remote switch activates electric motor that retracts latchbolt; automatic latching and deadlocking when door is closed (slam locking). Latchbolt can be mechanically retracted by mogul cylinder; keyed one side or two sides.
    - a. Latchback: Latchbolt remains retracted until door is opened 2 inches, then releases.
    - b. If power fails, latchbolt automatically deadlocks (fail secure).
  3. Latchbolt: 1-1/2-inch-high by 3/4-inch- thick hardened steel; 1-inch throw.
  4. Provide internal deadlock indicator switch.
  5. Provide roller-type deadlock actuator.
  6. Voltage: As scheduled.
  7. Listed and labeled for use on fire doors.
  8. Security Grade: 1 according to ASTM F 1577.
- D. Motor-Operated Gate Locks, Mogul Cylinder:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Function: Remote switch activates electric motor that raises an internal bolt; automatic deadlocking when gate is closed. Bolt can be mechanically retracted by five -tumbler paracentric cylinder; keyed one side or two sides.
    - a. Latchback: Bolt remains raised until gate is closed.
    - b. If power fails, latchbolt automatically deadlocks (fail secure).
  3. Bolt: 5/8-inch- diameter stainless steel; 1-inch throw.
  4. Provide internal deadlock indicator switch.
  5. Voltage: 120-V ac.
  6. Finish: Galvanized.
  7. Mounting: Mount lock to gate post; mount locking tongue to gate frame.
  8. Security Grade: 1 according to ASTM F 1577.
- 2.7 DETENTION LOCK TRIM
- A. Levers: Solid stainless steel.
  - B. Cylinder Shields for Paracentric Locks: 0.125-inch- thick, 3-inch- diameter brass with BHMA 606 finish and swinging cover to protect keyhole. Attach with security fasteners.
    1. Style: Single or double wing as required by lock function.
- 2.8 DETENTION CYLINDERS AND KEYING
- A. Source Limitations: Subject to compliance with requirements, provide cylinders and keying for paracentric and mogul cylinders by same manufacturer as for detention locks and latches.
  - B. Paracentric Cylinders: Manufacturer's standard lever-tumbler type, constructed from one-piece spring-tempered brass; with tumblers activated by phosphor bronze springs; five tumblers per lock.
  - C. Mogul Cylinders: Manufacturer's standard pin-tumbler type, minimum 2-inch diameter; body constructed from brass or bronze, stainless steel, or nickel silver; with stainless-steel tumblers and engaging cylinder balls; complying with the following:
    1. Number of Pins: Six.
    2. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
      - a. High-Security Grade: Listed and labeled as complying with pick- and drill-resistant testing requirements in UL 437 (Suffix A).
    3. Finish: BHMA 606.

- D. Keying System: Provide a factory-registered keying system complying with the following requirements:
  - 1. Paracentric cylinders operated by change keys only.
  - 2. Master Key System: Mogul cylinders operated by a change key and a master key.
- E. Keys: Provide cast silicon-bronze copper alloy keys complying with the following:
  - 1. Stamping: Permanently inscribe each key with a visual key-control number and include the following notation:
    - a. "DO NOT DUPLICATE."
  - 2. Quantity: In addition to one extra blank key for each lock, provide the following:
    - a. Cylinder Change Keys: Three.
    - b. Master Key(s): One.

## 2.9 SWITCHES

- A. General: Provide switches configured with contact type required for functions indicated, including multiple circuiting where required by functional performance of Section 28 52 11 "Detention Monitoring and Control Systems."
- B. Magnetic Door Position Switches, Concealed: Consist of actuating magnet mortised into detention and switch mortised into frame with stainless steel faceplate, 24 VDC, factory-wired with plug connector. Wire in series with lock monitors. Attach with security fasteners.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
- C. Surface-Mounted Door Position Switches: Switch enclosed in 0.134-inch nominal-thickness steel enclosure, factory primed for painting; 120-V ac; factory wired with plug connector. Wire in series with lock monitors. Attach with security fasteners.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  - 2. Galvanize enclosure for exterior locations.
- D. Strike Indicator Switches: Designed to be mortised behind strike and to indicate whether door is locked or unlocked; enclosed in metal strike box. Wire in series with door position switches. Attach with security fasteners.
  - 1. Voltage: 120-V dc.
  - 2. Locations: Where indicated.
  - 3. Manufacturer: Same as detention lock.

## 2.10 DETENTION OPERATING TRIM

- A. Standard: BHMA A156.6, Grade 1.
- B. Surface-Mounted Door Pulls: 8-3/4-inch overall length and 2-1/4-inch projection; attach to door with two security fasteners.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  - 2. Material: Cast stainless steel with BHMA 630 finish.
- C. Flush Door Pulls: 5 inches high by 4 inches wide by 1 inch deep, with 1/8-inch- thick faceplate; attach to door with four security fasteners.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Southern Folger Detention Equipment Company.
  2. Material: Formed, wrought, or cast brass/bronze with BHMA 626 finish.
- D. Lever-Handle Guides: Guide tracks and escutcheons that provide selective stopping of lever handle by use of an adjustable stop; fabricated from steel with BHMA 633 finish. Attach with security fasteners.
- 2.11 SECURITY DOOR CLOSERS
- A. Standard: BHMA A156.4, Grade 1.
1. Certified Products: Provide security door closers listed in BHMA's "Directory of Certified Door Products."
- B. Surface-Mounted Security Door Closers:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Corbin Russwin, Inc.; an ASSA ABLOY Group company.
    - b. LCN; an Allegion brand.
    - c. Norton Door Controls; an ASSA ABLOY Group company.
    - d. Yale Security Inc; an ASSA ABLOY Group company.
  2. Arms: Minimum 3/8-inch- thick by 1-1/8-inch- wide, rectangular steel main arm; 5/16-inch- thick by 1-inch- wide, rectangular steel secondary arm; full rack-and-pinion type; fabricated with orbital-riveted, pinned, or welded elbow and arm shoe/soffit plate joints designed to prevent disassembly with ordinary hand tools.
  3. Cover: Heavy-duty metal, attached with four security fasteners.
  4. Mounting: Attach security door closer with security fasteners.
- C. Unit Size: Comply with manufacturer's written recommendations for size of security door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to comply with field conditions and requirements for opening force.
- 2.12 DETENTION DOOR STOPS
- A. Detention Floor Stops: 1-1/2-inch-high by 2-inch- diameter, rubber bumper mounted on steel lag bolt; BHMA A156.16; install in floor with nonshrink grout; for detention doors unless wall or other type stops are indicated. Do not mount floor stops where they can impede traffic.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Burns Manufacturing Incorporated.
    - b. Hager Companies.
    - c. Southern Folger Detention Equipment Company.
    - d. Triangle Brass Manufacturing Co., Inc.
    - e. Airteq, a Division of Cornerstone Detention Products, Inc.
- B. Silencers for Detention Door Frames: BHMA A156.16, Grade 1; neoprene or rubber, minimum 1/2-inch diameter; fabricated for drilled-in application to detention door frame. Attach with security fasteners.
- 2.13 FABRICATION
- A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.

- B. Base Metals: Produce detention door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified detention door hardware units and BHMA A156.18 finishes.
- C. Detention Lock Construction: Fabricate detention lock case and cover plate from steel plate. Fabricate bolts from solid sections; laminated construction is unacceptable.

#### 2.14 HARDWARE FINISHES

- A. Standard: Comply with BHMA A156.18.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. BHMA Designations: Comply with base material and finish requirements indicated by the following:
  - 1. BHMA 600: Primed for painting, over steel base metal.
  - 2. BHMA 606: Satin brass, clear coated, over brass base metal.
  - 3. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
  - 4. BHMA 630: Stainless steel, satin, over stainless-steel base metal.
  - 5. BHMA 633: Satin brass plated, clear coated, over steel base metal.
  - 6. BHMA 652: Satin chromium plated over nickel, over steel base metal.

#### 2.15 SECURITY FASTENERS

- A. Security Fasteners: Refer to Section 05 05 53.

### **PART 3 - EXECUTION**

#### 3.1 EXAMINATION

- A. Examine detention doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention door hardware connections before detention door hardware installation.
- C. Inspect built-in and cast-in anchor installations, before installing detention door hardware, to verify that anchor installations comply with requirements. Prepare inspection reports.
  - 1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
  - 2. Perform additional inspections to determine compliance of replaced or additional work.
- D. Verify locations of detention door hardware with those indicated on Shop Drawings.
- E. Examine roughing-in for electrical power systems to verify actual locations of connections before detention door hardware installation.
- F. Investigate doors to be reused. Notify Architect of any conditions that would be detrimental to re-installation.
- G. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Steel Detention Doors and Frames: Comply with BHMA A156.115 Series.
  - 1. Surface-Applied Detention Door Hardware: Drill and tap detention doors and frames according to SDI A250.6.

### 3.3 INSTALLATION

- A. Mounting Heights: Mount detention door hardware units at heights indicated in DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
- B. Install each detention door hardware item to comply with Shop Drawings and manufacturer's written instructions. Where cutting and fitting are required to install detention door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
  - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
  - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinge Installation:
  - 1. Welding: Where indicated, weld hinges to detention doors and frames with continuous fillet weld around three sides of hinge perimeter.
  - 2. Security Fasteners: Provide socket flat countersunk head machine screws; finish screw heads to match surface of detention hinges. Install into drilled and tapped holes.
- D. Install interconnecting wiring and connectors between detention door hardware devices. Terminate device wiring for detention door hardware installed in swinging doors at a plug-type connector located in lock pocket or door frame junction box and for sliding doors at a junction box in door frame.
- E. Security Fasteners: Install detention door hardware using security fasteners with head style appropriate for installation requirements, strength, and finish of adjacent materials.

### 3.4 FIELD QUALITY CONTROL

- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
- B. Perform the following tests and inspections:
  - 1. After installing electrically powered detention door hardware and after electrical circuitry has been energized, test detention door hardware for compliance with requirements.
    - a. Test: Operate lock of each door and group of doors in normal remote, normal local, and emergency operating modes. Verify that remote controls operate correct door locks and in correct sequence.
  - 2. Verify that lock bolts engage strikes with required bolt projection.
  - 3. Verify that detention door hardware is installed, connected, and adjusted according to the Contract Documents.
  - 4. Verify that electrical wiring installation complies with manufacturer's submittal and written installation requirements.
- C. Detention work will be considered defective if it does not pass tests and inspections.
- D. Perform additional inspections to determine compliance of replaced or additional work.
- E. Prepare field quality-control certification endorsed by Detention Equipment Contractor that states installed products comply with requirements in the Contract Documents.
- F. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Adjust and check each operating item of detention door hardware and each detention door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust detention door-control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by detention door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that detention door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain detention door hardware and detention door hardware finishes.

3.8 DETENTION DOOR HARDWARE SCHEDULE

- A. General: Provide detention door hardware for each detention door to comply with requirements in this Section and with detention door hardware sets indicated below.

**Hardware Set DH1.1 - Secure Perimeter - Exterior/Weather**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	LOCK	10120AE x 115VAC	US26D	Southern Steel
1	EA	STRIKEPLATE	Mortise Strikeplate		Southern Steel
1	EA	SHIELD	219 M Mogul Cylinder Shield	UA26D	Southern Steel
1	EA	CLOSER	2210 Concealed		LCN
2	EA	PULLS	212C Raised Pull	US32D	Southern Steel
1	EA	THRESHOLD	171A		Pemko
1	EA	WEATHERSTRIPPING	312CR Head and Jamb		Pemko
1	EA	RAIN DRIP/SEAL	347A with 68AR Seal		Pemko
1	EA	SEAL	4301CRL Automatic Door Bottom		Pemko
1	EA	DPS	220A		Southern Steel

Function: Pin tumbler, solenoid-actuated lock, standard operation without latchback, and mechanically at door by mogul cylinder key with remote operation at control panel. Latch retracts by momentary depression of switch where it is held without power until door is moved open to release auxiliary latch. After door opens, the latch is extended and the door can be closed for relocking. Monitor door position and lock status.

**Hardware Set DH1.2 - Secure Perimeter - Exterior**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	LOCK	10120 AM x 24VDC	US26D	Southern Steel
1	EA	STRIKEPLATE	Mortise Strikeplate		Southern Steel
1	EA	CLOSER	2210 Concealed		LCN
2	EA	PULLS	212C Raised Pull	US32D	Southern Steel
1	EA	STOP	420 Wall Bumper		Southern Steel
1	EA	DPS	220A		Southern Steel

Function: Pin tumbler, motor-actuated lock utilizing two-position cam with remote operation at control panel and mechanically at door by mogul cylinder key with momentary depression of switch, latch retracts where it is held without power until door is moved open to release auxiliary latch. After door opens, the latch is extended and the door can be closed for relocking. Monitor door position and lock status.

**Hardware Set DH1.3 - Secure Perimeter - Interior**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	LOCK	10120 AM x 24VDC	US26D	Southern Steel
1	EA	STRIKEPLATE	Mortise Strikeplate		Southern Steel
1	EA	CLOSER	2210 Concealed		LCN
2	EA	PULLS	212C Raised Pull	US32D	Southern Steel
1	EA	THRESHOLD	114A Pass-Proof		Pemko
1	EA		Hook x 12 Gauge	304 SS	DHM Supplier
1	EA	STOP	420 Wall Bumper		Southern Steel
1	EA	SMOKE SEALS	S88D x 17'		Pemco
1	EA	DPS	220A		Southern Steel

Function: Pin tumbler, motor-actuated lock utilizing two-position cam with remote operation at control panel and mechanically at door by mogul cylinder key with momentary depression of switch, latch retracts where it is held without power until door is moved open to release auxiliary latch. After door opens, the latch is extended and the door can be closed for relocking. Monitor door position and lock status.



**Hardware Set DH1.4 - Secure Perimeter - Exterior/Weather/Exercise**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	LOCK	10120AE x 115VAC	US26D	Southern Steel
1	EA	STRIKEPLATE	Mortise Strikeplate		Southern Steel
1	EA	SHIELD	219 M Mogul Cylinder Shield	UA26D	Southern Steel
1	EA	CLOSER	2210 Concealed		LCN
2	EA	PULLS	214S Recessed Pull	US32D	Southern Steel
1	EA	RAIN DRIP/SEAL	347A with 68AR Seal		Pemko
1	EA	DPS	220A		Southern Steel

Function: Pin tumbler, solenoid-actuated lock, standard operation without latchback, and mechanically at door by mogul cylinder key with remote operation at control panel. Latch retracts by momentary depression of switch where it is held without power until door is moved open to release auxiliary latch. After door opens, the latch is extended and the door can be closed for relocking. Monitor door position and lock status.

**Hardware Set DH3.1 - Padded Cell - Exterior Perimeter, UL Fire Resistive Rated**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	LOCK	10120 AM x 24 VDC	US26D	Southern Steel
1	EA	STRIKEPLATE	Mortise Strikeplate		Southern Steel
1	EA	CLOSER	2210		LCN
1	EA	PULLS	212C Raised		Southern Steel
1	EA	THRESHOLD	114A Pass-Proof		Pemko
1	EA	SMOKE SEAL	S88D x 17's		Pemko
1	EA	DPS	200 MRS Magnetic Switch		Southern Steel
1	EA	BOTTOM SWEEP	18062CNB X 36"		Pemko

Function: Pin tumbler, solenoid-actuated lock, standard operation without latchback, with remote operation at control panel and mechanically at door by mogul cylinder key with momentary depression of switch, latch retracts where it is held without power until door is moved open to release auxiliary latch. After door opens, the latch is extended and the door can be closed for relocking. Monitor door position and lock status. .

**Hardware Set DH3.2 - Padded Cell - Interior Perimeter, UL Fire Resistive Rated**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	LOCK	10120 AM x 24 VDC	US26D	Southern Steel
1	EA	STRIKEPLATE	Mortise Strikeplate		Southern Steel
1	EA	CLOSER	2210 Concealed		LCN
1	EA	PULLS	212C Raised		Southern Steel
1	EA	DPS	200 MRS Magnetic Switch		Southern Steel
1	EA	BOTTOM SWEEP	18062CNB X 36"		Pemko
1	EA	SMOKE SEALS	S88D x 17'		Pemko

Function: Pin tumbler, solenoid-actuated lock, standard operation without latchback, with remote operation at control panel and mechanically at door by mogul cylinder key with momentary depression of switch, latch retracts where it is held without power until door is moved open to release auxiliary latch. After door opens, the latch is extended and the door can be closed for relocking. Monitor door position and lock status.

**Hardware Set DH5.1 - Janitor's Closet/Inmate Toilet/Storage/Office**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	DEADBOLT	10507 (Storage Function)	US32D	Southern Steel
1	EA	STOP	420 Wall Bumper		Southern Steel

Function: Mechanical mortise lockset with storage function. Deadlock actuator. Keyed both sides, free access. Lever outside always rigid.

**Hardware Set DH5.2 – Program Room**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	DEADLATCH	1070A-2-HM		Southern Steel
1	EA	STRIKEPLATE	471 GL (Switch)		Southern Steel
1	EA	PULLS	212C Raised		Southern Steel
1	EA	DPS	200 MRS Magnetic Switch		Southern Steel

Function: Mechanical automatic deadlatch operated by paracentric key. Keyed on outside. Monitored at Central Control

**Hardware Set DH5.3 – Courtroom Holding Room/Receiving Cells**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	DEADLATCH	1070A-1-HM		Southern Steel
1	EA	STRIKEPLATE	471 GL (Switch)		Southern Steel
1	EA	PULLS	212C Raised		Southern Steel
1	EA	DPS	200 MRS Magnetic Switch		Southern Steel

Function: Mechanical automatic deadlatch operated by paracentric key. Keyed on outside. Monitored at Central Control

**Hardware Set DH5.4 – Visitation/Conference**

3	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	DEADBOLT	10572	US32D	Southern Steel

Function: Mechanical operated mortise lockset, lever rigid both sides. Latch, bolt operated by key both sides. Deadlock actuator.

**Hardware Set DH5.5 – Change-Over**

4	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	DEADBOLT	1026-206	US32D	Southern Steel

Function: Mechanically operated mortise deadbolt, key both sides, handles inactive.

**Hardware Set DH5.6 - Medication Storage**

3	EA	HINGE	204 FMSS	US32D	Southern Steel
1	EA	DEADBOLT	10603E-24 VDC	US32D	Southern Steel
1	EA	POWER TRANSFER	204E	US32D	Southern Steel
1	EA	CLOSER	2210 Concealed		LCN
1	EA	DPS	200MRS Magnetic Switch		Southern Steel
1		CARD READER			By Div. 28

Function: Electrical/Mechanical operated mortise lockset with electrically controlled outside lever operates latch bolt when outside lever is locked out. Key outside lever is locked, except when power is applied. Lever inside always active.

**Hardware Set DH5.6 - Medication Storage**

Remove knob from 10500 mortise lockset. Provide lever and lever escort to existing 10500 mortise lockset.

**Hardware Set DH6.1 - Detention Access Panels - Wall Mounted**

1	EA	DEADBOLT	12		Southern Steel
2	EA	HINGE	3FS		Southern Steel

**Hardware Set DH6.2 - Security Ceiling Access Panel**

1	EA	DEADBOLT	12		Southern Steel
2	EA	HINGE	HD Piano Hinge x Continuous	SS	Panel Mfr.

**Hardware Set DH6.6 -Food Pass Door**

1	EA	LOCK	7017M-1 x Hinge Side		Southern Steel
2	EA	HINGE	735 x Hinge Side		Midwest Portland

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## **SECTION 08 80 00 - GLAZING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Glass products.
  - 2. Insulating glass.
  - 3. Glazing tapes.
  - 4. Miscellaneous glazing materials.

#### **1.3 DEFINITIONS**

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

#### **1.4 COORDINATION**

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

#### **1.5 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for glazing during and after installation.

#### **1.6 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- C. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.

#### **1.7 INFORMATIONAL SUBMITTALS**

- A. Sample Warranties: For special warranties.

#### **1.8 QUALITY ASSURANCE**

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved by primary glass manufacturer.

- B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors.
  - C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- 1.10 FIELD CONDITIONS
- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
- 1.11 WARRANTY
- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
    - 1. Warranty Period: 10 years from date of Substantial Completion.
  - B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.
    - 1. Warranty Period: 10 years from date of Substantial Completion.
  - C. Manufacturer's Special Warranty for Heat-Soaked Tempered Glass: Manufacturer agrees to replace heat-soaked tempered glass units that spontaneously break due to nickel sulfide (NiS) inclusions at a rate exceeding 0.3 percent within specified warranty period. Coverage for any other cause is excluded.
    - 1. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations for Glass: Obtain coated glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:
  - 1. Design Wind Pressures: As indicated on Drawing S001.
    - a. Wind Design Data: As indicated on Drawings.
  - 2. Design Snow Loads: As indicated on Drawings.
  - 3. Probability of Breakage for Sloped Glazing: For glass sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
  - 4. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
  - 5. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
  - 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
  - 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
  - 3. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on LBL's WINDOW 7 computer program, expressed as Btu/sq. ft. x h x deg F.
  - 4. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on LBL's WINDOW 7 computer program.
  - 5. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

### 2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. NGA Publications: "Glazing Manual."
  - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
  - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
  - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
  - 1. Minimum Glass Thickness for Exterior Lites: 6 mm.

- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

## 2.4 MONOLITHIC GLASS PRODUCTS

- A. Basis-of-Design Glass Products: Subject to compliance with requirements, provide products indicated or equivalent products by one of the following:
1. AGC Glass Company North America, Inc.
  2. Cardinal Glass Industries
  3. Guardian Industries Corp.
  4. Oldcastle Building Envelope
  5. Pilkington North America
  6. Vetrotech Saint-Gobain
  7. Viracon, Inc.
  8. Vitro Architectural Glass (formerly PPG Glass)
- B. Monolithic Glass Types:
1. Float glass, Type I, Class 1, Quality Q3, 1/4-inch thick.
  2. Safety glass, Type I, Class 1, Quality Q3, Kind FT - fully tempered, 1/4-inch thick.
  3. Fire-rated safety glass, equivalent to Technical Glass Products; FireLite Plus, 5/16-inch thick; labeled and listed by UL for use in 60 and minute UL labeled doors and frames.
  4. Mirror glass, Type I, Class 1, Quality Q2, 1/4-inch thick.
  5. Safety glass for Display Case Doors, Type I, Class 1, Quality Q3, Kind FT - fully tempered, 1/2-inch thick unless other thickness determined by Section 08 41 26 delegated-design professional engineer.
  6. Safety glass for Display Case Shelves, Type I, Class 1, Quality Q3, Kind FT - fully tempered, 3/8-inch thick.

## 2.5 INSULATING GLASS

- A. Basis-of-Design Glass Products: Subject to compliance with requirements, provide products indicated or equivalent products by one of the following:
1. AGC Glass Company North America, Inc.
  2. Cardinal Glass Industries
  3. Guardian Industries Corp.
  4. Oldcastle Building Envelope
  5. Pilkington North America
  6. Vetrotech Saint-Gobain
  7. Viracon, Inc.
  8. Vitro Architectural Glass (formerly PPG Glass)
- B. Insulating Glass Types:
1. IGU-A: Clear Vision Glass: Sunguard; Superneutral on Ultrawhite with heat-strengthened inboard and outboard lites or equivalent insulating glass with the following properties:
    - a. Overall Unit Thickness: 1 inch.
    - b. Low-E Coating: On #2 surface.
    - c. Inboard Substrate: Clear.
    - d. Outboard Substrate: Clear.
    - e. Visible Light Transmittance: 55 percent minimum.
    - f. Winter Nighttime U-Factor: 0.29 maximum.



- g. Solar Heat Gain Coefficient: 0.28 maximum.
    - h. Appearance: Match A/E's sample.
  - 2. IGU-B: Safety Glass: Same as Type A except with fully-tempered inboard and outboard lites. Provide safety glazing labeling.
  - 3. IGU-C: Spandrel Glass: Same as Type A except with heat-strengthened inboard and outboard lites and factory applied silicone color coating on #4 surface. Color to be selected by Architect.
  - 4. IGU-D: Translucent Glass: Same as Type A except with translucent film on #4 surface.
- C. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
- 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
  - 2. Perimeter Spacer: Manufacturer's standard spacer material and construction.
  - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.
- 2.6 GLAZING SEALANTS
- A. General:
- 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.
- B. Neutral-Curing Silicone Glazing Sealant, Class 100/50: Complying with ASTM C920, Type S, Grade NS, Use NT.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. GE Construction Sealants; Momentive Performance Materials Inc.
    - b. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - c. Pecora Corporation.
    - d. Sika Corporation.
    - e. The Dow Chemical Company.
    - f. Tremco Incorporated.
- 2.7 GLAZING TAPES
- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
- 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  - 2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
- 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
  - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks:
  - 1. EPDM with Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers:
  - 1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks:
  - 1. EPDM with Shore A durometer hardness per manufacturer's written instructions.
- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- G. Display Case Door Hardware
  - 1. Sliding Door Track: Equivalent to Knappe & Vogt P992 ZC complete track assembly, length as required to fit openings.
  - 2. Glass Door Locks: Equivalent to Knappe & Vogt 963 CHR adjustable ratchet lock.
- H. Window Film (Finish Code WF1): As indicated in Interior Finish Legend.

## 2.9 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
  - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
    - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 2. Presence and functioning of weep systems.
  - 3. Minimum required face and edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
  - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 2. Provide 1/8-inch- minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.

- F. Apply heel bead of elastomeric sealant where indicated.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### 3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### 3.7 WINDOW FILM

- A. Thoroughly clean area where window film is to be installed.
- B. Clean glass thoroughly and proceed immediately with film installation.
- C. Install window film using manufacturer's recommend method.
  - 1. Protect surrounding finishes from installation liquids where film is field-applied.
- D. Entrapped foreign matter will be cause for rejection of window film installation.

### 3.8 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.

- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

### 3.9 GLAZING SCHEDULE

- A. Install glazing as follows:
  - 1. Hollow metal doors and frames (interior) as specified in Section 08 11 13, glazing method: Tape Dry/Dry.
  - 2. Hollow metal doors and frames (exterior) as specified in Section 08 11 13, glazing method: Tape Wet/Dry.
  - 3. Wood doors as specified in Section 08 14 16, glazing method: Tape Dry/Dry.
  - 4. Detention steel doors and frames as specified in Section 08 34 63, glazing method: Sealant Wet/Wet.
  - 5. Aluminum-framed entrances and storefronts as specified in Section 08 41 13, glazing method: Gasket Dry/Dry.
  - 6. Glazed aluminum curtain wall as specified in Section 08 44 13, glazing method: Gasket Dry/Dry.

END OF SECTION

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## **SECTION 08 88 53 - SECURITY GLAZING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes monolithic polycarbonate laminated glass, laminated polycarbonate glass-clad polycarbonate, laminated glass, and polycarbonate and insulating security glazing for the following applications:
  - 1. Windows
  - 2. Doors.
  - 3. Interior borrowed lites.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for general requirements for detention work.
  - 2. Section 05 05 53 "Security Metal Fasteners."
  - 3. Section 08 34 63 "Detention Doors and Frames."

#### **1.3 DEFINITIONS**

- A. Glazing Manufacturers: Firms that produce primary glass, monolithic plastic glazing, or fabricated security glazing, as defined in referenced glazing publications.
- B. Interspace: Space between lites of air-gap security glazing or insulating security glazing.

#### **1.4 COORDINATION**

- A. Coordinate glazing channel dimensions to provide necessary bite on security glazing, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

#### **1.5 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for security glazing during and after installation.

#### **1.6 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Security Glazing Samples: For each type of security glazing; 12 inches square.
- C. Glazing Accessory Samples: For sealants, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Security Glazing Schedule: List security glazing types and thicknesses for each size opening and location. Use same designations indicated on Drawings. Indicate coordinated dimensions of security glazing and construction that receives security glazing, including clearances and glazing channel dimensions.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installers manufacturers of insulating security glazing with sputter-coated, low-e coatings glazing testing agency and sealant testing agency.
- B. Product Certificates: For each type of product indicated, from manufacturer.
- C. Product Test Reports: For each type of glazing sealant, for tests performed by a qualified testing agency.
  - 1. Provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test reports.
- E. Sample Warranties: For special warranties.

#### 1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating Security Glazing Units with Sputter-Coated, Low-E Coatings: A qualified insulating glazing manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glazing installers for this Project who are certified under the National Glass Association Glazier Certification Program.
- C. Security Glazing Testing Agency Qualifications: Subject to compliance with requirements, testing agency is one of the following:
  - 1. H. P. White Laboratory, Inc.
  - 2. Underwriters Laboratories, Inc.
  - 3. Wiss, Janney, Elstner Associates, Inc.
  - 4. Warnock-Hersey International.
- D. Sealant Testing Agency Qualifications: Qualified according to ASTM C 1021 for testing indicated.
- E. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
  - 1. Install security glazing in mockups specified in to match glazing systems required for Project, including glazing methods.
  - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### 1.9 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each security glazing type, tape sealant, gasket, glazing accessory, and glazing-framing member for adhesion to and compatibility with elastomeric glazing sealants.
  - 1. Testing will not be required if data based on previous testing of current sealant products and glazing materials match those submitted.
  - 2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to security glazing, tape sealants, gaskets, and glazing channel substrates.
  - 3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
  - 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  - 5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.



1.10 DELIVERY, STORAGE, AND HANDLING

- A. Protect security glazing and glazing materials according to manufacturer's written instructions. Prevent damage from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating security glazing and with air-gap security glazing manufacturers' written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

1.12 WARRANTY

- A. Manufacturer's Special Warranty on Laminated Glass: Manufacturer agrees to replace laminated glass that deteriorates within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Polycarbonate Sheet: Manufacturer agrees to replace polycarbonate sheet that deteriorates within specified warranty period. Deterioration of polycarbonate sheet is defined as defects developed from normal use that are not attributed to maintaining and cleaning polycarbonate sheet contrary to manufacturer's written instructions. Defects include yellowing and loss of light transmission.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty for Laminated Polycarbonate: Manufacturer agrees to replace laminated polycarbonate that deteriorates within specified warranty period. Deterioration of laminated polycarbonate is defined as defects developed from normal use that are not attributed to maintaining and cleaning laminated polycarbonate contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glazing, blemishes exceeding those allowed by referenced standard, yellowing, and loss of light transmission.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- D. Manufacturer's Special Warranty for Glass-Clad Polycarbonate: Manufacturer agrees to replace glass-clad polycarbonate that deteriorates within specified warranty period. Deterioration of glass-clad polycarbonate is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning glass-clad polycarbonate contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glazing, blemishes exceeding those allowed by referenced glass-clad polycarbonate standard, yellowing, and loss of light transmission.
  - 1. Warranty Period: Five years from date of Substantial Completion.

- E. Manufacturer's Special Warranty for Laminated Glass and Polycarbonate: Manufacturer agrees to replace laminated glass and polycarbonate that deteriorates within specified warranty period. Deterioration of laminated glass and polycarbonate is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass and polycarbonate contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glazing, blemishes exceeding those allowed by referenced glass-clad polycarbonate standard, yellowing, and loss of light transmission.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations for Security Glazing: Obtain security glazing from single source from single manufacturer using the same types of lites, plies, interlayers, and spacers for each security glazing type indicated.
  - 1. Source Limitations for Tinted Glass: Obtain from single source from single primary glass manufacturer for each tint color indicated.
- B. Source Limitations for Glazing Sealants and Gaskets: Obtain from single source from single manufacturer for each product and installation method.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. General:
  - 1. Installed security glazing shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing; or other defects in construction.
  - 2. Installed security glazing shall withstand security-related loads and forces without damage to the glazing beyond that allowed by referenced standards.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated.
  - 1. Design Procedure for Glass: ASTM E 1300 and ICC's International Building Code.
  - 2. Design Wind Pressures: As indicated on Drawings.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glazing framing members and glazing components.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

### **2.3 SECURITY GLAZING, GENERAL**

- A. Glazing Publications: Comply with published recommendations of security glazing and glazing material manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
  - 2. AAMA Publications: AAMA GD SG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
  - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."

4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Plastic Glazing Labeling: Identify plastic sheets with appropriate markings of applicable testing and inspecting agency, indicating compliance with required fire-test-response characteristics.
  - C. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glazing, glass thickness, and safety glazing standard with which glazing complies.
  - D. Insulating Glazing Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council.
  - E. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
  - F. Fire-Test-Response Characteristics of Polycarbonate Sheets: As determined by testing polycarbonate sheets identical to those used in security glazing products by a qualified testing agency acceptable to authorities having jurisdiction.
    1. Self-ignition temperature of 650 deg F or more when tested according to ASTM D 1929 on plastic sheets in thicknesses indicated for the Work.
    2. Smoke-Developed Index of 450 or less when tested according to ASTM E 84, or smoke density of 75 or less when tested according to ASTM D 2843 on plastic sheets in thicknesses indicated for the Work.
    3. Burning extent of 1 inch or less when tested according to ASTM D 635 at a nominal thickness of 0.060 inch or thickness indicated for the Work.
  - G. Thermal and Optical Performance Properties: Provide security glazing with performance properties specified, as indicated in manufacturer's published test data, based on construction products indicated and on procedures indicated below:
    1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
    2. Solar-Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
    3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

## 2.4 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
  1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
  2. For heat-strengthened float glass, comply with requirements for Kind HS.
  3. For fully tempered float glass, comply with requirements for Kind FT.
  4. For uncoated glass, comply with requirements for Condition A.
  5. For coated vision glass, comply with requirements for Condition C (other coated glass).
- C. Chemically Strengthened Glass: Annealed float glass is chemically strengthened to comply with ASTM C 1422, Surface Compression Level 2 and Case Depth Level A.
- D. Reflective-Coated Vision Glass: ASTM C 1376, Kind CV (coated vision glass), coated by vacuum deposition (sputter-coating) process, and complying with other requirements specified.

## 2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
  - 1. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
  - 2. Interlayer Color: Clear unless otherwise indicated.

## 2.6 POLYCARBONATE SECURITY GLAZING

- A. Polycarbonate Sheet: ASTM C 1349, Appendix X1, Type II, coated, mar-resistant, UV-stabilized polycarbonate with coating on exposed surfaces and Type I, standard, UV-stabilized polycarbonate where no surfaces are exposed.
- B. Laminated Polycarbonate: Polycarbonate sheets laminated with clear urethane interlayer that complies with ASTM C 1349, Appendix X2, and has a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation. Provide laminated units that comply with requirements of ASTM C 1349 for maximum allowable laminating process blemishes and haze.
- C. Glass-Clad Polycarbonate: ASTM C 1349.
- D. Laminated Glass and Polycarbonate: ASTM C 1349.

## 2.7 GLAZING SEALANTS

- A. General:
  - 1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they contact, including security glazing, seals of insulating security glazing and air-gap security glazing, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Suitability: Comply with sealant and security glazing manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT, G, and O.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dow Corning Corporation.
    - b. GE Construction Sealants; Momentive Performance Materials Inc.
    - c. Pecora Corporation.
    - d. Sika Corporation.
    - e. Tremco Incorporated.

## 2.8 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and security glazing manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
  - 1. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.9 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of security glazing and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by security glazing manufacturer to maintain security glazing lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit security glazing lateral movement (side walking).

## 2.10 FABRICATION OF SECURITY GLAZING

- A. Fabricate security glazing in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine framing for security glazing, with Installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 2. Presence and functioning of weep system.
  - 3. Minimum required face or edge clearances.
  - 4. Minimum required bite.
  - 5. Effective sealing between joints of framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving security glazing immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

## 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of security glazing, sealants, gaskets, and other glazing materials unless more stringent requirements are indicated, including those in referenced glazing publications.

- B. Protect edges of security glazing from damage during handling and installation. Remove damaged security glazing from Project site and legally dispose of off Project site. Damaged security glazing includes units with edge or face damage or other imperfections that, when installed, could weaken security glazing and impair performance and appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications unless otherwise required by glazing unit manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by security glazing manufacturers for installing lites.
- F. Provide spacers for security glazing lites where the length plus width is larger than 50 inches.
  - 1. Locate spacers directly opposite each other on both inside and outside faces of security glazing. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with performance requirements.
  - 2. Provide 1/8-inch minimum bite of spacers on glazing lites and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent security glazing from moving sideways in glazing channel, as recommended in writing by security glazing manufacturer and according to requirements in referenced glazing publications.
- H. Set security glazing in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set coated security glazing with proper orientation so that coatings and films face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

#### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by security glazing, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center security glazing in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### 3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket securely in place between glazing unit and frame or fixed stop, so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center security glazing in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in security glazing. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center security glazing in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in security glazing. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between security glazing and glazing stops to maintain face clearances and to prevent sealant from extruding into glazing channel and blocking weep systems. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to security glazing and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial washaway from security glazing.

### 3.7 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect security glazing from contact with contaminating substances resulting from construction operations, including weld splatter. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. If, despite such protection, contaminating substances do come into contact with security glazing, remove substances immediately as recommended in writing by security glazing manufacturer. Remove and replace security glazing that cannot be cleaned without damage.
- C. Wash security glazing on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash security glazing as recommended in writing by security glazing manufacturer.

### 3.8 SECURITY GLAZING SCHEDULE

- A. DG-1A: Not used.

- B. DG-2A: Equivalent to Global Secur-Tem+Poly SP019, 3/4-inch thick; ASTM F 1915, Grade 2 (40-minute containment rated).
- C. DG-2B: Same as Type DG-2A except with Pilkington Mirropane one-way mirror glass-clad polycarbonate, 13/16-inch thick; ASTM F 1915, Grade 2 (40-minute containment rated).
- D. DG-3A: Equivalent to Global Secur-Tem+Poly 2116 glass-clad polycarbonate, 11/16 inch thick; ASTM F 1915, Grade 3 (20-minute containment rated).

END OF SECTION



## SECTION 08 91 19 - FIXED LOUVERS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Fixed extruded-aluminum louvers.
  - 2. Blank-off panels for louvers

#### 1.2 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades (i.e., the axis of the blades are horizontal).
- C. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
  - 1. Show weep paths, gaskets, flashings, sealants, and other means of preventing water intrusion.
  - 2. Show mullion profiles and locations.
- C. Delegated Design Submittal: For louvers indicated to comply with structural performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed in accordance with AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.
- B. Sample Warranties: For manufacturer's special warranties.

#### 1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
  - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

#### 1.6 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

## 1.7 WARRANTY

- A. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of organic finishes within specified warranty period.
  - 1. Deterioration includes, but is not limited to, the following:
    - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
    - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
    - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
  - 2. Warranty Period: years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain fixed louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural performance requirements and design criteria indicated.
- B. Structural Performance: Louvers withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures are considered to act normal to the face of the building.
  - 1. Wind Loads:
    - a. Determine loads based on pressures as indicated on Drawings.
- C. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width in accordance with AMCA 500-L.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- E. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

### 2.3 FIXED EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal Drainable-Blade Louver, Extruded Aluminum:
  - 1. Manufacturers: Subject to compliance with requirements, provide Greenheck Fan Corporation; Model ESD-635HP or equivalent products by one of the following:
    - a. Air Flow Company, Inc.
    - b. Airolite Company, LLC
    - c. Construction Specialties, Inc.
    - d. Pottorff.
    - e. Ruskin Company.
  - 2. Louver Depth: 6 inches.

3. Frame and Blade Nominal Thickness: Not less than 0.080 inch.
4. Mullion Type: Exposed.
5. Louver Performance Ratings:
  - a. Free Area: Not less than 9.84 sq. ft. for 48-inch- wide by 48-inch- high louver.
  - b. Point of Beginning Water Penetration: Not less than 910 fpm.
  - c. Air Performance:
    - 1) Not more than 0.056-inch wg static pressure drop at 557-fpm free-area intake velocity.
6. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## 2.4 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
  1. Screen Location for Fixed Louvers: Interior face.
  2. Screening Type: Bird screening.
- B. Secure screen frames to louver frames with stainless steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
  1. Metal: Same type and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
  2. Finish: Mill finish unless otherwise indicated.
  3. Type: Non-rewirable, U-shaped frames.
- D. Louver Screening for Aluminum Louvers, Contractor's Option:
  1. Bird Screening, Aluminum: 1/2-inch- square mesh, 0.063-inch wire.
  2. Bird Screening, Stainless Steel: 1/2-inch- square mesh, 0.047-inch wire.
  3. Bird Screening, Flattened, Expanded Aluminum: 3/4 by 0.050 inch thick.

## 2.5 BLANK-OFF PANELS

- A. Insulated Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.
  1. Thickness: 2 inches.
  2. Metal Facing Sheets, Aluminum: Not less than 0.032-inch nominal thickness.
  3. Insulating Core: Rigid, glass-fiber-board insulation.
  4. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard channel frames, with corners mitered and with same finish as panels.
  5. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
  6. Attach blank-off panels with sheet metal screws.

## 2.6 MATERIALS

- A. Aluminum Extrusions: ASTM B221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
  1. Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
  2. For fastening aluminum, use aluminum or 300 series stainless steel fasteners.

- D. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless steel components, with allowable load or strength design capacities calculated in accordance with ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing in accordance with ASTM E488/E488M conducted by a qualified testing agency.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

## 2.7 FABRICATION

- A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
- C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
  - 1. Frame Type: Channel unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated, but not more than is recommended by manufacturer, or 72 inches o.c., whichever is less.
  - 1. Semirecessed Mullions: Where required to reach sizes indicated, provide mullions partly recessed behind louver blades, so louver blades appear continuous. Where length of louver exceeds fabrication and handling limitations, fabricate with interlocking split mullions and close-fitting blade splices designed to permit expansion and contraction.
- G. Provide subsills made of same material as louvers or extended sills for recessed louvers.
- H. Join frame members to each other and to fixed louver blades with fillet welds , threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

## 2.8 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.
  - 1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions .
  - 2. Color and Gloss: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

### 3.3 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 07 92 00 "Joint Sealants" for sealants applied during louver installation.

### 3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
  - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION

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## **DIVISION 09**





## **SECTION 09 21 16.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Gypsum board shaft wall assemblies.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each component of gypsum board shaft wall assembly.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and support them on risers on a flat platform to prevent sagging.

#### **1.5 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with gypsum-shaftliner-board manufacturer's written instructions.
- B. Do not install finish panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, or mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E90 and classified according to ASTM E413 by a testing and inspecting agency.

#### **2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES**

- A. Fire-Resistance Rating: As indicated on Drawings.
- B. Gypsum Shaftliner Board:
  - 1. Type X: ASTM C1396/C1396M; manufacturer's proprietary fire-resistive liner panels with paper faces, 1 inch thick, with double beveled long edges.

- a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1) American Gypsum.
  - 2) CertainTeed Corporation.
  - 3) Georgia-Pacific Gypsum LLC.
  - 4) National Gypsum Company.
  - 5) USG Corporation.
- C. Non-Load-Bearing Steel Framing, General: Complying with ASTM C645 requirements for metal unless otherwise indicated and complying with requirements for fire-resistance-rated assembly indicated.
  - 1. Protective Coating: ASTM A653/A653M, G40, hot-dip galvanized unless otherwise indicated.
- D. Studs: Manufacturer's standard profile for repetitive, corner, and end members as follows:
  - 1. Depth: As indicated.
- E. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches long and matching studs in depth.
- F. Finish Panels: Gypsum board as specified in Section 09 29 00 "Gypsum Board."

## 2.3 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with shaft wall manufacturer's written instructions.
- B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Section 09 29 00 "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written instructions for application indicated.
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
- D. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.
  - 1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488/E488M conducted by a qualified testing agency.
  - 2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E1190 conducted by a qualified testing agency.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated and manufacturer's written installation instructions.
- B. Do not bridge building movement joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.
- C. Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.
- D. Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices and similar items.
- E. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels while maintaining continuity of fire-rated construction.
- F. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect while maintaining fire-resistance rating of gypsum board shaft wall assemblies.
- G. Sound-Rated Shaft Wall Assemblies: Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly.
- H. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

### 3.3 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, or mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

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## **SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Non-load-bearing steel framing systems for interior partitions.
  - 2. Suspension systems for interior ceilings and soffits.
  - 3. Grid suspension systems for gypsum board ceilings.
- B. Related Requirements:
  - 1. Section 05 40 00 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; and roof rafters and ceiling joists.

#### **1.2 DELIVERY, STORAGE, AND HANDLING**

- A. Notify manufacturer of damaged materials received prior to installation.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.
- C. Horizontal Deflection: For composite wall assemblies, limited to 1/240 of the wall height based on horizontal loading of 5 lbf/sq. ft..
- D. Design framing systems in accordance with AISI S220, "North American Specification for the Design of Cold-Formed Steel Framing - Nonstructural Members," unless otherwise indicated.
- E. Design Loads: As indicated on architectural Drawings or 5 lbf/sq. ft. minimum as required by the IBC.
- F. Design framing systems to accommodate deflection of primary building structure and construction tolerances and to withstand design loads with a maximum deflection of 2 inches.

#### **2.2 FRAMING SYSTEMS**

- A. Framing Members, General: Comply with for conditions indicated.
  - 1. Steel Sheet Components: Comply with AISI S220 and ASTM C645, Section 10 requirements for metal unless otherwise indicated
  - 2. Protective Coating: Comply with AISI S220; ASTM A653/A653M, G40; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.

- a. Coating demonstrates equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.
- B. Studs and Track: AISI S220 and ASTM C645, Section 10.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ClarkDietrich.
    - b. MarinoWARE.
    - c. Phillips Manufacturing Co.
  2. Minimum Base-Steel Thickness: As required by performance requirements for horizontal deflection.
  3. Depth: As indicated on Drawings.
- C. Embossed, High Strength Steel Studs and Tracks: Roll-formed and embossed with surface deformations to stiffen the framing members so that they are structurally comparable to conventional ASTM C645 steel studs and tracks.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ClarkDietrich.
    - b. MarinoWARE.
    - c. Phillips Manufacturing Co.
    - d. Minimum Base-Steel Thickness: As required by horizontal deflection performance requirements.
    - e. Depth: As indicated on Drawings.
- D. Slip-Type Head Joints: Where indicated, provide one of the following:
  1. Clip System: Clips designed for use in head-of-wall deflection conditions that provide a positive attachment of studs to tracks while allowing 2-inch minimum vertical movement.
  2. Double-Track System: ASTM C645 top outer tracks, inside track with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
  3. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- E. Firestop Tracks: Top track manufactured to allow partition heads to expand and contract with movement of structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- F. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
  1. Minimum Base-Steel Thickness: 0.0179 inch.
- G. Cold-Rolled Channel Bridging: Steel, 0.0538-inch minimum base-steel thickness, with minimum 1/2-inch- wide flanges.
  1. Depth: 1-1/2 inches.
  2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.
- H. Hat-Shaped, Rigid Furring Channels: ASTM C645.
  1. Minimum Base-Steel Thickness: 0.0179 inch.
  2. Depth: As indicated on Drawings.
- I. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical.
- J. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.
1. Depth: As indicated on Drawings.
  2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch.
  3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- 2.3 SUSPENSION SYSTEMS
- A. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch- diameter wire, or double strand of 0.048-inch- diameter wire.
- B. Hanger Attachments to Concrete:
1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 AC193 AC58 or AC308 as appropriate for the substrate.
    - a. Uses: Securing hangers to structure.
    - b. Type: Torque-controlled, expansion anchor torque-controlled, adhesive anchor or adhesive anchor.
    - c. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
  2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.
- D. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-steel thickness of 0.0538 inch and minimum 1/2-inch- wide flanges.
- E. Furring Channels (Furring Members):
1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.
  2. Steel Studs and Tracks: ASTM C645.
    - a. Depth: As indicated on Drawings.
  3. Embossed, High-Strength Steel Studs and Tracks: ASTM C645.
    - a. Depth: As indicated on Drawings.
  4. Hat-Shaped, Rigid Furring Channels: ASTM C645, 7/8 inch deep.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C645, direct-hung system composed of main beams and cross-furring members that interlock.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Armstrong Ceiling & Wall Solutions.
    - b. Certainteed; SAINT-GOBAIN.
    - c. Rockfon (Rockwool International).
    - d. USG Corporation.
- 2.4 AUXILIARY MATERIALS
- A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Existing Exterior Walls: Provide the following:
  1. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
  1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
  1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
  2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

#### **3.3 INSTALLATION, GENERAL**

- A. Installation Standard: ASTM C754.
  1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

#### **3.4 INSTALLING FRAMED ASSEMBLIES**

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.



1. Single-Layer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
  2. Multilayer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
  3. Tile Backing Panels: 16 inches o.c. unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
  2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
    - a. Install two studs at each jamb unless otherwise indicated.
    - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
    - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
  3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
  4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
    - a. Firestop Track: At Contractor's option in lieu of joint firestopping, install to maintain continuity of fire-resistance-rated assembly indicated.
  5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
- E. Direct Furring:
1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

### 3.5 INSTALLING CEILING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
1. Hangers: 48 inches o.c.
  2. Carrying Channels (Main Runners): 48 inches o.c.
  3. Furring Channels (Furring Members): 24 inches o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

- a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
    - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
  - 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
  - 4. Do not attach hangers to steel roof deck.
  - 5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
  - 6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
  - 7. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION

## **SECTION 09 24 00 - CEMENT PLASTERING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Interior horizontal detention plasterwork.
- B. Related Requirements:
  - 1. Section 01 22 00 "Unit Prices."
  - 2. Section 01 23 00 "Allowances."

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials inside under cover, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

#### **1.6 FIELD CONDITIONS**

- A. Comply with ASTM C 926 requirements.
- B. Interior Plasterwork: Maintain room temperatures at greater than 40 deg F for at least 48 hours before plaster application, and continuously during and after application.
  - 1. Avoid conditions that result in plaster drying out during curing period. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
  - 2. Ventilate building spaces as required to remove water in excess of that required for hydrating plaster in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.

### **PART 2 - PRODUCTS**

#### **2.1 METAL LATH**

- A. Expanded Metal Lath: Fabricate expanded metal lath security mesh from galvanized steel sheet to produce lath complying with ASTM C 847 and MIL-M-17194C Type II Class 1:
  - 1. Thickness: Minimum .048 inch.
  - 2. Short dimension of diamond opening: Maximum 3/4".

## 2.2 ACCESSORIES

- A. General: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Alabama Metal Industries Corporation; a Gibraltar Industries company.
    - b. CEMCO; California Expanded Metal Products Co.
    - c. ClarkDietrich Building Systems.
    - d. MarinoWARE.
    - e. Phillips Manufacturing Co.
  - 2. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
  - 3. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.

## 2.3 MISCELLANEOUS MATERIALS

- A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch long, free of contaminants, manufactured for use in cement plaster.
- C. Bonding Compound (if required): ASTM C 932.
- D. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1063.
- E. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter unless otherwise indicated.

## 2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I.
  - 1. Color for Finish Coats: Gray.
- B. Sand Aggregate: ASTM C 897.
- C. Perlite Aggregate: ASTM C 35.

## 2.5 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.
  - 1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. of cementitious materials.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
  - 1. Portland Cement Mixes:
    - a. Scratch Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

- b. Brown Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
- C. Job-Mixed Finish-Coat Mixes:
  - 1. Portland Cement Mix: For cementitious materials, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare smooth, solid substrates for plaster according to ASTM C 926.

#### **3.3 INSTALLING METAL LATH**

- A. Metal Lath: Install according to ASTM C 1063.
  - 1. Flat-Ceiling and Horizontal Framing: Install flat-diamond-mesh lath.

#### **3.4 INSTALLING ACCESSORIES**

- A. Install according to ASTM C 1063 and at locations indicated on Drawings.
- B. Control Joints: Locate as approved by Architect for visual effect and as follows:
  - 1. At distances between control joints of not greater than 18 feet o.c.
  - 2. Where control joints occur in surface of construction directly behind plaster.
  - 3. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

#### **3.5 PLASTER APPLICATION**

- A. General: Comply with ASTM C 926.
  - 1. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces when measured by a 10-foot straightedge placed on surface.
  - 2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
  - 3. Provide plaster surfaces that are ready to receive field-applied finishes indicated.
- B. Bonding Compound: Apply on concrete substrates for direct application of plaster.
- C. Ceilings; Base-Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three-coat plasterwork and having 1/2-inch total thickness, as follows:
  - 1. Portland cement mixes.

3.6 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protection and enclosure of other work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION

## SECTION 09 29 00 - GYPSUM BOARD

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Interior gypsum board.
  - 2. Acoustical sealants.
  - 3. Ballistic panels within gypsum board assemblies.
- B. Related Requirements:
  - 1. Section 06 16 00 "Sheathing" for gypsum sheathing for exterior walls.
  - 2. Section 09 21 16.23 "Gypsum Board Shaft Wall Assemblies" for metal shaft-wall framing, gypsum shaft liners, and other components of shaft-wall assemblies.
  - 3. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

#### 1.3 REFERENCES

- A. Underwriter's Laboratories, Inc. (UL)
  - 1. Fire Resistance Directory, Current Edition.
  - 2. Building Materials Directory, Current Edition.
- B. American Standard for Testing and Materials (ASTM)
  - 1. ASTM C 475 - Specification for Joint Treatment Materials for Gypsum Wallboard Construction.
  - 2. ASTM C 754 - Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.
  - 3. ASTM C 840 - Specification for Application and Finishing of Gypsum Board.
  - 4. ASTM C 919 - Practices for Use of Sealants in Acoustical Applications.
  - 5. ASTM C 1396 - Specification for Gypsum Board.
  - 6. ASTM E 119 - Method for Fire Tests of Building Construction and Materials.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

#### 1.6 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

### **2.2 GYPSUM BOARD, GENERAL**

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- B. Gypsum Wallboard:
  1. General: Provide gypsum board, ASTM C 1396, of types indicated below in maximum lengths available to minimize end-to-end joints.
    - a. USG Sheetrock EcoSmart Firecode X "Type X" Gypsum Panels - 5/8-inch thick unless otherwise indicated.
    - b. USG Sheetrock Firecode Core "Type C" Gypsum Panels - 5/8-inch thick unless otherwise indicated.
    - c. USG Sheetrock Mold Tough Firecode Core "Type X" Gypsum Panels - 5/8-inch thick unless otherwise indicated.
    - d. USG Durock Glass-Mat Tile Backerboard - 5/8-inch thick unless otherwise indicated

### **2.3 TRIM ACCESSORIES**

- A. Partition Gap Closure: Pre-assembled, spring-loaded, extruded aluminum closure unit for vertical junctions of partitions and exterior wall mullions; equivalent to Mullion Mate as manufactured by Gordon Interior Specialties Division, Gordon, Inc.
  1. Aluminum Extrusions: ASTM B221 (ASTM B 221M), Alloy 6063-T5.
  2. Sound Reduction: Minimum STC of 56.
  3. Finish: Match exterior wall mullion finish.
  4. Accessories: Gaskets with adhesive both sides and sound attenuation batt insulation.
  5. Sizes: Provide lengths and sizes to completely fill openings indicated on Drawings.
- B. Interior Trim: ASTM C 1047.
  1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc Paper-faced galvanized-steel sheet.
  2. Shapes:
    - a. Cornerbead.
    - b. Tear-Away L-Bead: L-shaped; exposed long flange receives joint compound.
    - c. Expansion (control) joint.
- C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.



1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Fry Reglet Corporation.
  - b. Gordon, Inc.
  - c. Pittcon Industries.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, Alloy 6063-T5.
3. Finish: Clear anodized.

#### 2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
  1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
  1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
  2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  3. Fill Coat: For second coat, use drying-type, all-purpose compound.
  4. Finish Coat: For third coat, use drying-type, all-purpose compound.
- D. Joint Compound for Tile Backing Panels:
  1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

#### 2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
  1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
  2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
  1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- D. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Grabber Construction Products.
    - b. Hilti, Inc.

- c. Pecora Corporation.
  - d. Specified Technologies, Inc.
  - e. USG Corporation.
- 2. Verify compatibility of sealant with penetrating items. Comply with sealant compatibility testing and verification processes as outlined in Section 07 92 00.
    - a. At CPVC pipe penetrations, use acoustical sealant recommended by manufacturer of CPVC pipe.
  - 3. Sealant shall have a VOC content of 250 g/L or less.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 APPLYING AND FINISHING PANELS, GENERAL**

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
  - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
  - 2. Fit gypsum panels around ducts, pipes, and conduits.
  - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Use compatible sealant at CPVC pipe penetrations. Comply with ASTM C 919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

### 3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
  - 1. Type X: Vertical surfaces unless otherwise indicated.
  - 2. Mold-Resistant Type: Restrooms and areas exposed to moisture.
  - 3. Type C: Where required for specific fire-resistance-rated assembly indicated.
  - 4. Glass-Mat Tile Backer: In wall locations scheduled to receive tile.
- B. Single-Layer Application:
  - 1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
  - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
    - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
  - 3. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
  - 1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
  - 2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
  - 3. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

### 3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
- C. Interior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners.
  - 2. Tear-Away L-Bead: Use where panels abut other construction.

### 3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 2: Panels that are substrate for tile .
  - 3. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
    - a. Primer and its application to surfaces are specified in Section 09 91 23 "Interior Painting."

### 3.6 APPLYING TEXTURE FINISHES

- A. Texture provided by Section 09 91 23 Contractor.

### 3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

## **SECTION 09 30 13 - CERAMIC TILING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Ceramic tile.
  - 2. Waterproof membrane.
  - 3. Crack isolation membrane.
  - 4. Metal edge strips.
- B. Related Requirements:
  - 1. Section 07 92 00 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
  - 2. Section 09 29 00 "Gypsum Board" for glass-mat, water-resistant backer board.
  - 3. Section 09 66 13 "Portland Cement Terrazzo Flooring" for precast terrazzo tile flooring.

#### **1.3 DEFINITIONS**

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Verification:
  - 1. Full-size units of each type and composition of tile and for each color and finish required. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.
  - 2. Full-size units of each type of trim and accessory.
  - 3. Metal edge strips in 6-inch lengths.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.

## 1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
  - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

## 1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Comply with one of the follo
  - 1. Installer is a Five-Star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.
  - 2. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
  - 3. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers for Project.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.

## 1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.
  - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
  - 1. Obtain setting and grouting materials from single manufacturer.
  - 2. Obtain waterproof membrane and crack isolation membrane, except for sheet products, from manufacturer of setting and grouting materials.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
  - 1. Stone thresholds.

2. Waterproof membrane.
3. Crack isolation membrane.
4. Cementitious backer units.
5. Metal edge strips.

## 2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
  1. Provide tile complying with Standard grade requirements.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
  1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

## 2.3 TILE PRODUCTS

- A. Ceramic Tile Type(Finish Codes prefixed with TL and TLB): As scheduled in the Interior Finish Legend.

## 2.4 WATERPROOF MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Noble Company (The).
- C. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and continuous fabric reinforcement.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. Custom Building Products.
    - c. H.B. Fuller Construction Products Inc. / TEC.
    - d. LATICRETE SUPERCAP, LLC.
    - e. MAPEI Corporation.

## 2.5 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch nominal thickness.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
    - a. Noble Company (The).
- C. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. Custom Building Products.
    - c. H.B. Fuller Construction Products Inc. / TEC.
    - d. LATICRETE SUPERCAP, LLC.
    - e. MAPEI Corporation.

## 2.6 SETTING MATERIALS

- A. Modified Dry-Set Mortar (Thinset): ANSI A118.4.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. Custom Building Products.
    - c. H.B. Fuller Construction Products Inc. / TEC.
    - d. LATICRETE SUPERCAP, LLC.
    - e. MAPEI Corporation.
  - 2. Provide prepackaged, dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive at Project site.
  - 3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

## 2.7 GROUT MATERIALS

- A. High-Performance Tile Grout: ANSI A118.3 and ANSI A118.7.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. Custom Building Products.
    - c. H.B. Fuller Construction Products Inc. / TEC.
    - d. LATICRETE SUPERCAP, LLC.
    - e. MAPEI Corporation.
  - 2. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.

## 2.8 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.



- B. Lippage Leveling System: Removable lippage levelling system capable of aligning edges without marring surface with built in weak point to remove tabs below surface of grout.
- C. Metal Edge Strips: Coved, Angle or L-shaped, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless steel, ASTM A276/A276M or ASTM A666, 300 Series exposed-edge material.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Blanke Corporation.
    - b. Ceramic Tool Company, Inc.
    - c. Schluter Systems L.P.

## 2.9 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
  - 2. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.
    - a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
    - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
  - 3. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
  - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.

- C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

### 3.3 INSTALLATION OF CERAMIC TILE

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
  - 1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
    - a. Tile floors in wet areas.
    - b. Tile floors consisting of tiles 8 by 8 inches or larger.
    - c. Tile floors consisting of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Utilize lippage leveling system to provide a smooth, uniform installation with lippage not to exceed ANSI A108.02 tolerances for porcelain tile with less than 1/4" joint.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.
- F. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- G. Where cove base has a flat, vertical return below the cove, install so that bottom of curved cove is flush with top of floor tile.
- H. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
  - 1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
  - 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
  - 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- I. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- J. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
  - 1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

- K. Metal Edge Strips: Install where exposed edge of tile flooring meets other flooring that finishes flush with or below top of tile and no threshold is indicated.

#### 3.4 INSTALLATION OF WATERPROOF MEMBRANE

- A. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
- B. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

#### 3.5 INSTALLATION OF CRACK ISOLATION MEMBRANE

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.
- B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

#### 3.6 ADJUSTING AND CLEANING

- A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.
- B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
  - 1. Remove grout residue from tile as soon as possible.
  - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

#### 3.7 PROTECTION

- A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

#### 3.8 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, Concrete Subfloor:
  - 1. Ceramic Tile Installation t Slab-On-Grade: TCNA F113; thinset mortar.
  - 2. Ceramic Tile Installation at Wet Areas on Suspended Slabs: TCNA F122; thinset mortar on waterproof membrane.
  - 3. Ceramic Tile Installation on Suspended Slabs: TCNA F125-Partial; thinset mortar on crack isolation membrane.
- B. Interior Wall Installations, Masonry or Concrete:
  - 1. Ceramic Tile Installation: TCNA W202E; thinset mortar.
    - a. Utilize membrane option at wet walls

- C. Interior Wall Installations, Wood or Metal Studs or Furring:
1. Ceramic Tile Installation: TCNA W245 or TCNA W248; thinset mortar on glass-mat, water-resistant gypsum backer board.

END OF SECTION

## **SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes acoustical panels and exposed suspension systems for interior ceilings.
- B. Related Requirements:
  - 1. Section 09 51 33 "Acoustical Metal Pan Ceilings" for ceilings consisting of metal-pan units with exposed and concealed suspension systems.
- C. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:
  - 1. Acoustical Panels: Set of 6-inch- square Samples of each type, color, pattern, and texture.
  - 2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch- long Samples of each type, finish, and color.
  - 3. Clips: Full-size hold-down clips.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For finishes to include in maintenance manuals.

#### **1.6 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.
  - 2. Hold-Down Clips: Equal to 2 percent of quantity installed.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

## 1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: Class A according to ASTM E 1264.
  - 2. Smoke-Developed Index: 50 or less.

### 2.3 ACOUSTICAL PANELS

- A. Manufacturers (Finish Codes CLG4, CLG5, and CLG6): Subject to compliance with requirements, provide products as scheduled in the Interior Finish Legend, or equivalent products by one of the following:
  - 1. American Gypsum.
  - 2. CertainTeed Corporation.
  - 3. United States Gypsum Company.
- B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E 1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

### 2.4 METAL SUSPENSION SYSTEM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. CertainTeed Corporation.
  - 3. Chicago Metallic Corporation.
  - 4. United States Gypsum Company.
- B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M and designated by type, structural classification, and finish indicated.
- C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.
  - 1. Structural Classification: Heavy-duty system.
  - 2. End Condition of Cross Runners: butt-edge type.
  - 3. Face Design: Flat, flush.
  - 4. Cap Material: Cold-rolled steel.
  - 5. Cap Finish: Painted white.

## 2.5 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated.
  - 1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488/E 488M or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
    - a. Type: Cast-in-place, Postinstalled expansion and Postinstalled bonded anchors.
    - b. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B 633, Class SC 1 (mild) service condition.
  - 2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.
- B. Wire Hangers, Braces, and Ties: Provide wires as follows:
  - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
  - 2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- diameter wire.
- C. Hold-Down Clips (CLG4): Manufacturer's recommended hold-down for Level 3 detention applications.

## 2.6 METAL EDGE MOLDINGS AND TRIM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. CertainTeed Corporation.
  - 3. Chicago Metallic Corporation.
  - 4. United States Gypsum Company.
- B. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements.
  - 1. Baked-Enamel or Powder-Coat Finish: Minimum dry film thickness of 1.5 mils . Comply with ASTM C 635/C 635M and coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

### 3.3 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. Suspend ceiling hangers from building's structural members and as follows:
  - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
  - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
  - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
  - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
  - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
  - 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
  - 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
  - 8. Do not attach hangers to steel deck tabs.
  - 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
  - 10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
  - 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.



1. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
  2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
  2. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
  3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
  4. Install hold-down clips in products indicated for use in detention areas; space according to panel manufacturer's written instructions unless otherwise indicated.
    - a. Hold-Down Clips: Space minimum 24 inches o.c. on all cross runners, centered on tiles.
- 3.4 ERECTION TOLERANCES
- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- 3.5 CLEANING
- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

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## **SECTION 09 57 53 - SECURITY CEILING ASSEMBLIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Security-plank security ceiling assemblies.

#### **1.3 COORDINATION**

- A. Detention Specialist: Coordinate with Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for requirements of this Section that are to be performed by Detention Specialist or other entity.
- B. Coordinate layout and installation of security ceiling assemblies with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples for Verification: For the following products, of sizes indicated below:
  - 1. Security Ceiling Panel Units: Full cross section by 12 inches long for each type of panel.
  - 2. Perimeter Supports, Closures, and Exposed Molding: 12 inches long for each type.
  - 3. Suspension System: 12 inches long.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Layout of panels, joint pattern, and transitions.
  - 2. Suspension system members.
  - 3. Method of attaching hangers to building structure.
  - 4. Size and location of access panels.
  - 5. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- B. Qualification Data: For Installer.
- C. Attachment Device Test Reports: Indicating capability to sustain, without failure, load indicated without pulling out from substrate.
- D. Examination reports documenting inspection of substrates, areas, and conditions.
- E. Anchor inspection reports documenting inspections of built-in and cast-in anchors.
- F. Field quality-control certification signed by Contractor and Detention Specialist.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver security ceiling panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Handle security ceiling panels, suspension system components, and accessories carefully to avoid damaging units and finishes in any way.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Security ceiling assemblies shall withstand normal thermal movement and structural loads without failure, including permanent deformation of security ceiling assembly components including pans and suspension system; noise or metal fatigue caused by vibration, deflection, and displacement of security ceiling units; and permanent damage to fasteners and anchors.
- B. Acoustical Performance: Provide security ceiling assemblies with acoustical ratings indicated, as determined according to ASTM E 1264 and the following:
  - 1. Noise Reduction Coefficient (NRC): ASTM C 423 and ASTM E 795 in Type E-400 mounting.
  - 2. Ceiling Attenuation Class (CAC): ASTM E 1414/E 1414M.

### 2.2 SECURITY-PLANK SECURITY CEILING ASSEMBLY

- A. Detention Level 1 (Finish Code CLG1): Double-Configuration Panels: Factory assembled units with cold-rolled steel top face sheet and metallic-coated steel bottom face sheet, welded to a truss core. Fabricate panels with a self-locking male/female lap joint for joining panels.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Trussbilt; TrussDek Double Skin Metal Plank Ceiling System, or an equivalent product by one of the following:
    - a. Kane Architectural Innovations; G-CLG-T
    - b. Steel Ceilings, Inc.
  - 2. Panel Width: Minimum 24 inches.
  - 3. Panel Length: Minimum 8 feet.
  - 4. Overall Panel Thickness: Minimum 2-inches.
  - 5. Minimum Uncoated Top Face Sheet Thickness: 0.074 inch (14-gage).
  - 6. Minimum Uncoated Bottom Face Sheet Thickness: 0.074 inch (14-gage).
  - 7. Truss Core: Fabricated from 0.015-inch thick, cold-rolled steel sheet bent into corrugated shape; welded to top and bottom face sheets at even spacings across and along length of panel.
  - 8. Bottom Face Sheet: Unperforated.
  - 9. Suspension System: Heavy-duty exposed system consisting of intermediate carriers supported by secondary support system attached to building structure.

- a. Intermediate Carriers: Formed from tees with a nominal 6-inch wide exposed face or built up from back-to-back angles or channels each with a nominal 3-inch wide exposed face; fabricated from minimum 0.134-inch thick (10-gage), cold-rolled steel sheet.
    - 1) Finish: Match security ceiling panels.
  - b. Secondary Support System:
    - 1) Hanger Rods: Minimum 3/8-inch diameter galvanized threaded rod, bolted to intermediate carriers and building structure.
  - c. Perimeter Supports: Wall mounted angles, tees, and bearing plates; fabricated from minimum 0.134-inch thick (10-gage), cold-rolled steel sheet; finished to match security ceiling panels.
- B. Detention Level 2 (Finish Code CLG2): Single-Configuration Panels: Fabricated from a single sheet of metal, with a self-locking male/female lap joint for joining panels.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Trussbilt; BarrierDek Single Skin Metal Plank Ceiling System or comparable product by one of the following:
    - a. Gordon, Inc.; Cel-Line
    - b. Rockfon (formerly Chicago Metallic Corporation); Securline
    - c. Steel Ceilings Inc.; Plank
    - d. Kane Architectural Innovations; G-CLG-N
  - 2. Steel Panels: Metallic-coated steel with minimum uncoated sheet thickness of 16 gage.
  - 3. Panel Width: 24 inches.
  - 4. Panel Length: Minimum 8 feet.
  - 5. Perforated.
    - a. Perforation Pattern: Manufacturer's standard.
    - b. Sound-Absorptive pads.
    - c. Noise Reduction Coefficient (NRC): 0.90.
- C. Security Access Panels: Material, perforation pattern, and finish same as security ceiling panels; designed for installation by security fasteners and security lock screwed through suspension system. Provide at locations indicated on Drawings and as coordinated with MEP contractors.
  - 1. Size: 24 by 24 inches.
- D. Closures: Fabricated from minimum 0.053-inch- thick steel sheet, finished to match security ceiling panels. Fasten with security fasteners or by welding.
- E. Suspension System: Heavy-duty exposed system consisting of intermediate carriers supported by secondary support system attached to building structure.
  - 1. Intermediate Carriers: Formed from tees with a nominal 5-inch- wide exposed face or built up from back-to-back angles or channels each with a nominal 2-1/2-inch- wide exposed face; fabricated from minimum 0.104-inch thick (12-gage), cold-rolled steel sheet.
    - a. Finish: Match security ceiling panels.
  - 2. Secondary Support System:
    - a. Hanger Rods: Minimum 3/8-inch diameter galvanized threaded rod, bolted to intermediate carriers and building structure.
- F. Perimeter Supports: Wall-mounted angles, tees, and bearing plates.
  - 1. Steel Perimeter Supports: Metallic-coated steel with minimum uncoated sheet thickness of 0.104 inch, finished to match security ceiling panels.

G. Exposed Edge Moldings and Trim: Provide exposed members as indicated or required for edges of security ceiling, fixture trim, beams, fasciae at changes in security ceiling height, and other conditions, of metal and finish matching security ceiling panels.

H. Materials:

1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B; uncoated suitable for exposed applications.
2. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, CS (Commercial Steel), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.
3. Steel Tubing: ASTM A 513/A 513M, Type B.

## 2.3 SOUND-ABSORPTIVE PADS

A. Plastic-Sheet-Wrapped, Mineral-Fiber Insulation: Pads consisting of nonrigid, vinyl chloride plastic sheet encapsulating unfaced mineral-fiber insulation.

1. Plastic Sheet: Not less than 0.003 inch thick; flat black.
2. Mineral Fiber: Glass fiber or fiber made from slag (mineral wool), complying with ASTM C 553, Type I, II, or III.
3. Surface Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - a. Flame-Spread Index: 25 or less.
  - b. Smoke-Developed Index: 50 or less.

## 2.4 FABRICATION

A. Panels: Form metal panels from sheet metals selected for their surface flatness, smoothness, and freedom from surface blemishes where exposed to view in finished unit. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, or variations in flatness exceeding those permitted by referenced standards for stretcher-leveled metal sheet.

1. Security Planks: Factory fabricate double-configuration security planks and join top and bottom face sheets by continuous weld over entire length of panel edge joints.

## 2.5 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.6 STEEL FINISHES

A. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning" or SSPC-SP 8, "Pickling". After cleaning, apply a conversion coating suited to the organic coating to be applied over it.

B. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

1. Color and Gloss: Manufacturer's standard white.

## 2.7 ACCESSORIES

- A. Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.
- B. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welding.
- C. Fasteners: Provide fasteners made of the same basic metal as the fastened metal, unless otherwise indicated. Do not use metals that are corrosive to or incompatible with materials joined. Do not use exposed fasteners except where unavoidable. Exposed fasteners shall be Torx head tamper resistant type security fastener.
- D. Anchors and Inserts: Use nonferrous metal or hot-dip galvanized anchors and inserts as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of security ceiling assemblies.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of security ceiling assembly connections before security ceiling assembly installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of security ceiling assemblies.
- D. Inspect built-in and cast-in anchor installations before installing security ceiling assemblies to verify that anchor installations comply with requirements. Prepare inspection reports.
  - 1. Repair, or remove and replace, anchors where inspections indicate noncompliance with specified requirements. Reinspect after repair or replacement.
  - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- E. Verify locations and layouts of security ceiling assemblies with those indicated on reflected ceiling plans and coordination drawings.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Measure each security ceiling area and establish layout of security ceiling panels to balance border widths at opposite edges of each security ceiling. Avoid using less-than-half-width panels at borders and comply with layout shown on reflected ceiling plans and coordination drawings.

### 3.3 GENERAL INSTALLATION

- A. Comply with CISCA's "Ceiling Systems Handbook" for installation of security ceiling assemblies.
- B. Install perimeter supports around perimeter of security ceiling area.
  - 1. Attach supports with anchor bolts or expansion anchors spaced not more than 12 inches o.c. and not more than 3 inches from ends. Miter corners accurately.
    - a. Level perimeter supports with suspension system to a tolerance of 1/8 inch in 12 feet.

2. Do not use exposed fasteners, including pop rivets, on moldings and trim. If exposed fasteners are unavoidable, obtain prior written approval from Architect for their use and use security fasteners.
  - C. Install accessories where indicated and as required to comply with performance requirements.
    1. Sound-Absorptive Pads: For security ceiling panels indicated, provide sound-absorptive pads of width and length to completely fill inside of each security ceiling panel.
- 3.4 SECURITY-PLANK SECURITY CEILING ASSEMBLY INSTALLATION
- A. Install security planks with long edges continuously interlocked. Adjust security planks to final position before permanently fastening. Provide minimum 1-1/2-inch end bearing.
    1. Attach adjacent security planks to each other with security fasteners spaced not more than 12 inches o.c. and not more than 6 inches from ends.
    2. Continuously weld ends of security planks to perimeter supports. Remove exposed projecting burrs, edges, and rough spots resulting from welding operations by grinding smooth.
    3. Attach ends of security planks to perimeter supports with security fasteners not more than 3 inches from edges of security plank. Fasten through exposed face of supports into security planks.
    4. Provide intermediate carriers for ends of security planks that are not supported by perimeter supports. To attach security planks to intermediate carriers, use same method as that used for attaching security planks to perimeter supports.
      - a. Support intermediate carriers from structure above by secondary support system spaced at 48 inches o.c. and bolted to carriers.
  - B. Access Panels: Install each access panel only where indicated.
  - C. Provide steel angle reinforcement on each side of openings that exceed 12 inches in any direction.
- 3.5 FIELD QUALITY CONTROL
- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
  - B. Remove and replace security ceiling assemblies where inspections indicate that work does not comply with specified requirements.
  - C. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
  - D. Prepare field quality-control certification endorsed by Detention Specialist that states installed products and their installation comply with requirements in the Contract Documents.
- 3.6 CLEANING
- A. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.
  - B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as that used for shop painting; comply with SSPC-PA 1 for touching up shop-painted surfaces.
    1. Apply by brush or spray to provide a minimum dry film thickness of 2 mils.

END OF SECTION



## **SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Thermoset-rubber base.
  - 2. Vinyl molding accessories.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

#### **1.5 FIELD CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

### **PART 2 - PRODUCTS**

#### **2.1 THERMOSET-RUBBER BASE (Finish Codes RB1 and RB2)**

- A. Manufacturers: Subject to compliance with requirements, provide products as scheduled in the Interior Finish Legend or equivalent products by one of the following:
  - 1. Burke Mercer Flooring Products; a division of Burke Industries Inc.
  - 2. Flexco.
  - 3. Johnsonite; A Tarkett Company.
  - 4. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
  - 1. Style and Location:

- a. Style A, Straight: Provide in areas with carpet.
    - b. Style B, Cove: Provide in areas with resilient floor coverings.
  - C. Thickness: 0.125 inch.
  - D. Height: As indicated on Drawings.
  - E. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.
  - F. Outside Corners: Job formed or preformed.
  - G. Inside Corners: Job formed or preformed.
  - H. Colors: As indicated by manufacturer's designations.
- 2.2 VINYL MOLDING ACCESSORY
- A. Manufacturers: Subject to compliance with requirements, provide products as scheduled in the Interior Finishes Legend or equivalent products by one of the following:
    - 1. Armstrong World Industries, Inc.
    - 2. Burke Mercer Flooring Products; a division of Burke Industries Inc.
    - 3. Johnsonite; A Tarkett Company.
    - 4. Roppe Corporation, USA.
  - B. Description: Vinyl stair-tread nosing (Finish Code STR1) and nosing for carpet transition strips (Finish Codes TS1 and TS2).
  - C. Profile and Dimensions: As indicated.
  - D. Colors and Patterns: As indicated by manufacturer's designations.
- 2.3 INSTALLATION MATERIALS
- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
  - B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
  - C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

#### **3.2 PREPARATION**

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

- B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
  - 4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
    - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours. OR
    - b. Pinless Moisture Meter: Tramex or equivalent moisture meter exhibiting a maximum 5.5 percent relative humidity moisture content.
    - c. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until materials are the same temperature as space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

### 3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
  - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
    - a. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
  - a. Cope corners to minimize open joints.

#### 3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

#### 3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
  1. Remove adhesive and other blemishes from surfaces.
  2. Sweep and vacuum horizontal surfaces thoroughly.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

## **SECTION 09 65 16 - RESILIENT SHEET FLOORING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Vinyl sheet flooring with backing and integral base.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples for Verification: For each type of resilient sheet flooring, in manufacturer's standard size, but not less than 6-by-9-inch sections of each color, texture, and pattern required.
  - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches long, of each color required.
- C. Welded-Seam Samples: For seamless-installation technique indicated and for each resilient sheet flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch Sample applied to a rigid backing and prepared by Installer for this Project.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

#### **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.
  - 1. Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store rolls upright.

#### **1.7 FIELD CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 85 deg F, in spaces to receive resilient sheet flooring during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during resilient sheet flooring installation.

- D. Close spaces to traffic for 48 hours after resilient sheet flooring installation.
- E. Install resilient sheet flooring after other finishing operations, including painting, have been completed.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

### **2.2 VINYL SHEET FLOORING WITH BACKING(Finish Codes VS1 and VSB1)**

- A. Products: As scheduled in Interior Finishes Legend.
- B. Seamless-Installation Method: Heat welded.
- C. Colors and Patterns: As indicated by manufacturer's designations.

### **2.3 INSTALLATION MATERIALS**

- A. Floor Product Moisture Barrier Adhesives: Unlimited moisture controlling , non-repositionable adhesive. Provide one of the following:
  - 1. ISE Logick Industries; MVBA 500.
  - 2. Taylor Adhesives; Resolute.
  - 3. Adhesives shall have a VOC content of 50 g/L or less.
- B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
  - 1. Adhesives shall have a VOC content of 50 g/L or less.
- C. Seamless-Installation Accessories:
  - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
    - a. Colors: Match flooring.
- D. Integral-Flash-Cove-Base Accessories:
  - 1. Cove Strip: 1-inch radius provided or approved by resilient sheet flooring manufacturer.
  - 2. Cap Strip: Square metal, vinyl, or rubber cap provided by resilient sheet flooring manufacturer and chosen by Architect from Manufacturer's full range.
  - 3. Corners: Metal outside corners and end stops provided or approved by resilient sheet flooring manufacturer.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
  - 4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
    - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Pinless Moisture Meter: Tramex or equivalent moisture meter exhibiting a maximum 5.5 percent moisture content.
    - c. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
    - d. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation utilizing appropriate installation adhesive for floor moisture conditions present at time of installation.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient sheet flooring until materials are the same temperature as space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

### 3.3 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
- C. Lay out resilient sheet flooring as follows:
  - 1. Maintain uniformity of flooring direction.
  - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.
  - 3. Match edges of flooring for color shading at seams.
  - 4. Avoid cross seams.
- D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.

- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
- H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Integral-Flash-Cove Base (Finish Code VSB1): Cove resilient sheet flooring. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.
  - 1. Install metal corners at outside corners.

#### 3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.
- B. Perform the following operations immediately after completing resilient sheet flooring installation:
  - 1. Remove adhesive and other blemishes from surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION



## **SECTION 09 65 19 - RESILIENT TILE FLOORING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Luxury vinyl floor tile.
  - 2. Rubber floor tile.
  - 3. Vinyl composition floor tile.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of resilient floor tile.
  - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
  - 2. Show details of special patterns.
- C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

#### **1.4 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

#### **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
  - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

#### **1.7 FIELD CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

### **2.2 LUXURY VINYL FLOOR TILE (Finish Code VT1)**

- A. Products: As scheduled in the Interior Finish Legend.

### **2.3 RUBBER FLOOR TILE (Finish Code RBR1)**

- A. Products: As scheduled in the Interior Finish Legend.

### **2.4 VINYL COMPOSITION FLOOR TILE (Finish Code VT3)**

- A. Products: Subject to compliance with requirements, provide products as scheduled in the Interior Finish Legend, or equivalent product by one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. Congoleum Corporation.
  - 3. Johnsonite; A Tarkett Company.
  - 4. Mannington Mills, Inc.
- B. Colors and Patterns: As indicated by manufacturer's designations.

### **2.5 INSTALLATION MATERIALS**

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Floor Product Moisture Barrier Adhesives: Unlimited-moisture controlling, non-repositionable adhesive. Provide one of the following:
  - 1. ISE Logick Industries; MVBA 500.
  - 2. Taylor Adhesives; Resolute.
  - 3. Adhesives shall have a VOC content of 50 g/L or less.
- C. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.
  - 1. Adhesives shall have a VOC content of 50 g/L or less.
- D. Floor Polish: Provide protective, liquid floor-polish products recommended by floor tile manufacturer.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
  - B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 PREPARATION
- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
  - B. Concrete Substrates: Prepare according to ASTM F 710.
    1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
    2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
    3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
    4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours. OR
      - b. Pinless Moisture Meter: Tramex or equivalent moisture meter exhibiting a maximum 5.5 percent moisture content.
      - c. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
      - d. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation utilizing appropriate installation adhesive for floor moisture conditions present at time of installation.
  - C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
  - D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
    1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
  - E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.
- 3.3 FLOOR TILE INSTALLATION
- A. Comply with manufacturer's written instructions for installing floor tile.
  - B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
    1. Lay tiles square with room axis unless indicated otherwise.
  - C. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

- D. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- F. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- G. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

#### 3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
  - 1. Remove adhesive and other blemishes from surfaces.
  - 2. Sweep and vacuum surfaces thoroughly.
  - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from marks, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish on VCT: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
  - 1. Apply two coats over VCT.
  - 2. Do not wax over luxury vinyl tile or rubber tile.
- E. Cover floor tile until Substantial Completion.

END OF SECTION

## **SECTION 09 66 13 - PORTLAND CEMENT TERRAZZO FLOORING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Precast terrazzo units.
- B. Related Requirements:
  - 1. Section 07 92 00 "Joint Sealants" for sealants installed with terrazzo.
  - 2. Section 09 30 13 "Ceramic Tiling" for precast terrazzo unit installation materials.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to terrazzo including, but not limited to, the following:
    - a. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
    - b. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For terrazzo to include in maintenance manuals.

#### **1.6 QUALITY ASSURANCE**

- A. Installer Qualifications: Meeting or exceeding requirements in Section 09 30 13.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name, and lot number if any.
- B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

#### **1.8 FIELD CONDITIONS**

- A. Environmental Limitations: Maintain interior ambient temperature above 50 deg F for 48 hours before and during terrazzo installation.
- B. Provide permanent interior lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

- C. Close spaces to traffic during terrazzo installation and for not less than 24 hours after installation unless manufacturer recommends a longer period.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of granular materials from single source with resources to provide materials of consistent quality in appearance and physical properties.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. NTMA Standards: Comply with NTMA's written recommendations for terrazzo type indicated unless more stringent requirements are specified.

### **2.3 PRECAST TERRAZZO (TZ3 and TZ4)**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products indicated in Interior Finish Legend or comparable product by one of the following:
  - 1. Precast Terrazzo Enterprises, Inc.
  - 2. Romoco Precast Terrazzo Products; a subsidiary of Roman Mosaic & Tile Company.
  - 3. Wausau Tile Inc.
- B. Precast Terrazzo Units : 5/8 inch thick, portland cement terrazzo units. Comply with NTMA's written recommendations for fabricating precast terrazzo units in sizes and profiles indicated. Reinforce units as required by unit sizes, profiles, and thicknesses and as recommended by manufacturer. Finish exposed-to-view edges and reveals to match face finish. Ease exposed edges to 1/8-inch radius.
  - 1. Color, Pattern, and Finish: As scheduled in Interior Finish Legend.

### **2.4 MISCELLANEOUS ACCESSORIES**

- A. Installation accessories: Provide installation accessories as specified in Section 09 30 13.
- B. Sealer: Factory-applied slip- and stain-resistant, penetrating-type sealer that is chemically neutral; does not affect terrazzo color or physical properties; is recommended by sealer manufacturer; and complies with NTMA's written recommendations for terrazzo type indicated.
  - 1. Surface Friction: Not less than 0.6 according to ASTM D 2047.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

### **3.2 PREPARATION**

- A. Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.

### 3.3 PRECAST TERRAZZO INSTALLATION

- A. Install precast terrazzo units using TCNA method scheduled in Section 09 30 13 for tile installation location and in compliance with manufacturer requirements unless otherwise indicated.
- B. Do not install units that are chipped, cracked, discolored, or improperly finished.
- C. Seal joints between units with cement grout matching precast terrazzo matrix .

### 3.4 REPAIR

- A. Cut out and replace terrazzo areas that evidence lack of bond with substrate or underbed, including areas that emit a "hollow" sound if tapped.

### 3.5 CLEANING AND PROTECTION

- A. Terrazzo Cleaning:
  - 1. Wash surfaces with cleaner immediately after final cleaning of terrazzo flooring according to both NTMA's and manufacturer's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow them to dry thoroughly.
- B. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION

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## **SECTION 09 66 23 - RESINOUS MATRIX TERRAZZO FLOORING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Thin-set, epoxy-resin terrazzo flooring.
- B. Related Requirements:
  - 1. Section 07 92 00 "Joint Sealants" for sealants installed with terrazzo.
  - 2. Section 09 67 23 "Resinous Flooring" for decorative resinous flooring systems applied as self-leveling slurries or as troweled or screeded mortars.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to terrazzo including, but not limited to, the following:
    - a. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
    - b. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
    - c. Review special terrazzo designs and patterns.
    - d. Review condition of existing terrazzo and incorporation of new.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: Include terrazzo installation requirements. Include plans, sections, component details, and relationship to other work. Show layout of the following:
  - 1. Divider strips.
  - 2. Control-joint strips.
  - 3. Accessory strips.
  - 4. Terrazzo patterns.
- C. Samples for Verification: For each type, material, color, and pattern of terrazzo and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo Sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare Samples of same thickness and from same material to be used for the Work, in sizes indicated below:
  - 1. Terrazzo: 6-inch- square Samples.
  - 2. Accessories: 6-inch- long Samples of each exposed strip item required.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer.
- B. Preinstallation moisture-testing reports.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For terrazzo to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
  - 1. Engage an installer who is certified in writing by terrazzo manufacturer as qualified to install manufacturer's products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in supplier's original wrappings and containers, labeled with source's or manufacturer's name, material or product brand name, and lot number if any.
- B. Store materials in their original, undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.
- B. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.
- C. Close spaces to traffic during terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.
- D. Control and collect water and dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.

**PART 2 - PRODUCTS**

2.1 MANUFACTURERS

- A. Source Limitations: Obtain primary terrazzo materials from single source from single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.
- B. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of granular materials from single source with resources to provide materials of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

- A. NTMA Standards: Comply with NTMA's written recommendations for terrazzo type indicated unless more stringent requirements are specified.

2.3 EPOXY-RESIN TERRAZZO

- A. Epoxy-Resin Terrazzo (Finish Codes TZ1, TZ2, TZB1 and TZB2): Comply with manufacturer's written instructions for matrix and aggregate proportions and mixing.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Crossfield Products Corp.

- b. Hi-Tek Polymers, Inc.
- c. Key Resin Company.
- d. Sherwin-Williams Company, General Polymers.
- e. Terrazzo & Marble Supply Companies.

B. Mix Color and Pattern: Match existing.

C. Materials:

1. Substrate-Crack-Suppression Membrane: Product of terrazzo-resin manufacturer, having minimum 120 percent elongation potential according to ASTM D 412.
  - a. Reinforcement: Fiberglass scrim.
2. Primer: Manufacturer's product recommended for substrate and use indicated.
3. Epoxy-Resin Matrix: Manufacturer's standard recommended for use indicated and in color required for mix indicated.
  - a. Physical Properties without Aggregates:
    - 1) Hardness: 60 to 85 per ASTM D 2240, Shore D.
    - 2) Minimum Tensile Strength: 3000 psi per ASTM D 638 for a 2-inch specimen made using a "C" die per ASTM D 412.
    - 3) Minimum Compressive Strength: 10,000 psi per ASTM D 695, Specimen B cylinder.
    - 4) Chemical Resistance: No deleterious effects by contaminants listed below after seven-day immersion at room temperature per ASTM D 1308.
      - a) Distilled water.
      - b) Mineral water.
      - c) Isopropanol.
      - d) Ethanol.
      - e) 0.025 percent detergent solution.
      - f) 1.0 percent soap solution.
      - g) 5 percent acetic acid.
      - h) 10 percent sodium hydroxide.
      - i) 10 percent hydrochloric acid.
      - j) 30 percent sulfuric acid.
  - b. Physical Properties with Aggregates: For terrazzo blended according to manufacturer's recommendations with one part epoxy resin with three parts marble aggregate consisting of 60 percent No. 1 chips and 40 percent No. 0 chips that is ground and grouted to a 1/4-inch nominal thickness, and cured for 7 days at 75 deg F plus or minus 2 deg F and at 50 percent plus or minus 2 percent relative humidity.
    - 1) Flammability: Self-extinguishing, maximum extent of burning 1/4 inch according to ASTM D 635.
    - 2) Thermal Coefficient of Linear Expansion: 0.0025 inch/inch per deg F according to ASTM C 531.
4. Aggregates: Comply with NTMA gradation standards for mix indicated and contain no deleterious or foreign matter.
  - a. Abrasion and Impact Resistance: Less than 40 percent loss per ASTM C 131/C 131M.
  - b. 24-Hour Absorption Rate: Less than 0.75 percent.
  - c. Dust Content: Less than 1.0 percent by weight.
5. Finishing Grout: Resin based.

## 2.4 STRIP MATERIALS

- A. Thin-Set Divider Strips: L-type angle in depth required for topping thickness indicated.

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1. Material: Match existing.
  2. Top Width: Match existing.
- B. Control-Joint Strips: Separate, double L-type angles, positioned back to back, that match material and color of divider strips and in depth required for topping thickness indicated.
- C. Accessory Strips: Match divider-strip width, material, and color unless otherwise indicated. Use the following types of accessory strips as required to provide a complete installation:
1. Base-bead strips for exposed top edge of terrazzo base.
  2. Edge-bead strips for exposed edges of terrazzo.
- 2.5 MISCELLANEOUS ACCESSORIES
- A. Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use.
- B. Anchoring Devices:
1. Strips: Provide mechanical anchoring devices or adhesives for strip materials as recommended by manufacturer and as required for secure attachment to substrate.
- C. Patching and Fill Material: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.
- D. Joint Compound: Terrazzo manufacturer's resinous product approved and recommended by manufacturer for application indicated.
- E. Resinous Matrix Terrazzo Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by sealer manufacturer for use on terrazzo type indicated.
- F. Sealer: Slip- and stain-resistant, penetrating-type sealer that is chemically neutral; does not affect terrazzo color or physical properties; and is recommended by sealer manufacturer.
1. Surface Friction: Not less than 0.6 according to ASTM D 2047.
  2. Acid-Base Properties: With pH factor between 7 and 10.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

#### **3.2 PREPARATION**

- A. Clean substrates of substances, including oil, grease, and curing compounds, that might impair terrazzo bond. Provide clean, dry, and neutral substrate for terrazzo application.
- B. Concrete Slabs:
1. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with terrazzo.
    - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
    - b. Repair damaged and deteriorated concrete according to terrazzo manufacturer's written instructions.

- c. Use patching and fill material to fill holes and depressions in substrates according to terrazzo manufacturer's written instructions.
  - C. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
  - D. Preinstallation Moisture Testing:
    - 1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      - a. Moisture-Vapor-Emission Test: Maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours when tested according to ASTM F 1869 using anhydrous calcium chloride.
      - b. Relative Humidity Test: Maximum 75 percent relative humidity measurement when tested according to ASTM F 2170 using in-situ probes.
    - 2. Proceed with terrazzo installation only after concrete substrates pass moisture testing.
  - E. Moisture-Vapor-Emission-Control Membrane: Install according to manufacturer's written instructions.
    - 1. Install on concrete substrates that incorporate lightweight aggregates.
    - 2. Install concrete substrates that fail preinstallation moisture testing.
  - F. Substrate-Crack-Suppression Membrane: Install to isolate and suppress substrate cracks according to manufacturer's written instructions.
    - 1. Prepare and prefill substrate cracks with membrane material.
    - 2. Install membrane at substrate cracks in areas to receive terrazzo.
    - 3. Reinforce membrane with fiberglass scrim.
  - G. Protect other work from water and dust generated by grinding operations. Control water and dust to comply with environmental protection regulations.
    - 1. Erect and maintain temporary enclosures and other suitable methods to limit water damage and dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.
- 3.3 EPOXY-RESIN TERRAZZO INSTALLATION
- A. Comply with NTMA's written recommendations for terrazzo and accessory installation.
  - B. Strip Materials:
    - 1. Divider and Control-Joint Strips:
      - a. Install control-joint strips back to back and directly above concrete-slab control joints.
      - b. Install control-joint strips with 1/4-inch gap between strips, and install sealant in gap.
      - c. Install strips in adhesive setting bed without voids below strips, or mechanically anchor strips as required to attach strips to substrate, as recommended by strip manufacturer.
    - 2. Accessory Strips: Install as required to provide a complete installation.
  - C. Apply primer to terrazzo substrates according to manufacturer's written instructions.
  - D. Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions.
    - 1. Terrazzo Finishing: Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.

- a. Rough Grinding: Grind with 24-grit or finer stones or with comparable diamond abrasives. Follow initial grind with 60/80-grit stones or with comparable diamond abrasives.
    - b. Grouting: Before grouting, clean terrazzo with water, rinse, and allow to dry. Apply and cure epoxy grout.
    - c. Fine Grinding/Polishing: Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted. Grind with -grit stones or with comparable diamond abrasives until grout is removed from surface. Match surface profile to existing terrazzo.
  - 2. Installation Tolerance: Limit variation in terrazzo surface from level to 1/4 inch in 10 feet; noncumulative.
- E. Install and finish poured-in-place terrazzo base at the same time the adjacent terrazzo flooring is installed.
- 3.4 REPAIR
- A. Cut out and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.
- 3.5 CLEANING AND PROTECTION
- A. Cleaning:
- 1. Remove grinding dust from installation and adjacent areas.
  - 2. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow them to dry thoroughly.
- B. Sealing:
- 1. Seal surfaces according to NTMA's written recommendations.
  - 2. Apply sealer according to sealer manufacturer's written instructions.
- C. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure that terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION

## **SECTION 09 68 13 - TILE CARPETING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Modular carpet tile.
- B. Related Requirements:
  - 1. Section 01 22 00 "Unit Prices" for moisture mitigating primer unit pricing requirements.
  - 2. Section 09 65 13 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
    - a. Review delivery, storage, and handling procedures.
    - b. Review ambient conditions and ventilation procedures.
    - c. Review subfloor preparation procedures.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
  - 2. Include manufacturer's written installation recommendations for each type of substrate.
- B. Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
  - 1. Carpet Tile: Full-size Sample.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.
- B. Sample Warranty: For special warranty.

#### **1.6 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
  - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
  - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

#### **1.7 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd..
- 1.8 QUALITY ASSURANCE
  - A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.
- 1.9 DELIVERY, STORAGE, AND HANDLING
  - A. Comply with the Carpet and Rug Institute's CRI 104.
- 1.10 FIELD CONDITIONS
  - A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.
  - B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
  - C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
  - D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.
- 1.11 WARRANTY
  - A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
    1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
    2. Failures include, but are not limited to, the following:
      - a. More than 10 percent edge raveling, snags, and runs.
      - b. Dimensional instability.
      - c. Excess static discharge.
      - d. Loss of tuft-bind strength.
      - e. Loss of face fiber.
      - f. Delamination.
    3. Warranty Period: 10 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

- 2.1 CARPET TILE (Finish Codes Prefixed with CPT)
  - A. Products: Provide products as scheduled in Interior Finish Legend.
  - B. Sustainable Design Requirements:
    1. Carpet and cushion shall comply with testing and product requirements of CRI's "Green Label Plus" testing program.
  - C. Anti-Static Performance Characteristics (CPT11):
    1. Electrostatic Propensity: Less than 0.4 kV according to AATCC 134.
    2. Electrical Resistance - ANSI/ESD S7.1, RTT, RTG:
      - a. 1.0 x 10<sup>6</sup> Ohms Minimum, 1.0 x 10<sup>9</sup> Ohms Maximum (ANSI/ESD S7.1-2013).
      - b. ANSI/ESD S20.20-2007:



- 1) ANSI/ESD S97.2 Voltage on a person < 100 volts when tested with approved conductive footwear system.
3. Grounding Frequency: 1 ground connector per 1,000 square feet and minimum of 1 per room.
4. Adhesive: <1.0x10<sup>6</sup> Ohms Rtt.

## 2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
  1. Anti-Static Flooring: Provide leveling and patching compounds acceptable to anti-static floor manufacturer.
- B. Moisture Barrier Adhesives: Moisture controlling, non-repositionable adhesive. Provide one of the following:
  1. ISE Logick Industries; MVBA 500.
  2. Taylor Adhesives; Pinnacle.
- C. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.
- D. Anti-Static Carpet Tile Accessories:
  1. Grounding Connector: 5 mm, 26 gauge Copper strip.
  2. Adhesive: Staticworx, Inc; Groundtack Low VOC conductive, releasable adhesive with integral conductive fibers.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- B. Examine carpet tile for type, color, pattern, and potential defects.
- C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 03 30 00 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
  1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas. Test according to one of the following:
    - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Pinless Moisture Meter: Tramex or equivalent moisture meter exhibiting a maximum 5.5 percent moisture content.
    - c. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
    - d. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation utilizing appropriate installation adhesive for floor moisture conditions present at time of installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- D. Metal Substrates: Clean grease, oil, soil and rust, and prime if recommended in writing by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

### 3.3 INSTALLATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread adhesive.
- C. Maintain dye-lot integrity. Do not mix dye lots in same area.
- D. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.
- E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.

### 3.4 ANTI-STATIC CARPET TILE INSTALLATION

- A. Install anti-static carpet tile and associated accessories in strict compliance with manufacturer's requirements.
- B. Apply floor adhesive uniformly to substrate in accordance with manufacturer's instructions. Butt carpet tile edges firmly together to form seams without gaps. Remove adhesive promptly from face of carpet.
- C. Provide Edge moldings at exposed edges and transitions to other flooring.
- D. Grounding: Copper grounding strips shall be placed approximately 25' to 40' apart throughout the installation or accessible to all I-beams or other designated building or electrical ground. The copper strip shall be installed at least every 1,000 square feet or 1 ground strip per room minimum.

### 3.5 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
  - 1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
  - 2. Remove yarns that protrude from carpet tile surface.
  - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION

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## **SECTION 09 84 33 - SOUND-ABSORBING WALL UNITS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes shop-fabricated, acoustical panel units tested for acoustical performance, including the following:
  - 1. Sound-absorbing wall panels.

#### **1.3 DEFINITIONS**

- A. NRC: Noise Reduction Coefficient.
- B. SAA: Sound Absorption Average.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include fabric facing, panel edge, core material, and mounting indicated.
- B. Shop Drawings: For unit assembly and installation.
  - 1. Include plans, elevations, sections, and mounting devices and details.
- C. Samples for Verification: For the following products:
  - 1. Fabric: Full-width by approximately 36-inch- long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
  - 2. Panel Edge: 12-inch- long Sample(s) showing each edge profile, corner, and finish.
  - 3. Core Material: 12-inch- square Sample at corner.
  - 4. Mounting Devices: Full-size Samples.
  - 5. Assembled Panels: Approximately 36 by 36 inches , including joints and mounting methods.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Electrical outlets, switches, and thermostats.
  - 2. Items penetrating or covered by units.
  - 3. Coordination with paneling.
- B. Sample Warranty: For manufacturer's special warranty.

#### **1.7 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For each type of unit to include in maintenance manuals. Include fabric manufacturers' written cleaning and stain-removal instructions.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with fabric and unit manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- B. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

## 1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install units until a lighting level of not less than 50 fc is provided on surfaces to receive the units.
- C. Air-Quality Limitations: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.
- D. Field Measurements: Verify unit locations and actual dimensions of openings and penetrations by field measurements before fabrication, and indicate them on Shop Drawings.

## 1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace units and components that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to the following:
    - a. Acoustical performance.
    - b. Fabric sagging, distorting, or releasing from panel edge.
    - c. Warping of core.
  - 2. Warranty Period: Two years from date of Substantial Completion.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Source Limitations: Obtain wall units specified in this Section from single source from single manufacturer.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Units shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: 25 or less.
    - b. Smoke-Developed Index: 450 or less.
  - 2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol or NFPA 286.

## 2.3 SOUND-ABSORBING WALL UNITS

- A. Sound-Absorbing Wall Panel (Finish Code WP1): Manufacturer's standard panel construction consisting of facing material laminated to front face, edges, and back edge border of core.
1. Manufacturers: Subject to compliance with requirements, provide Conwed Designscape; Respond HI panels or equivalent products by one of the following:
    - a. Armstrong World Industries.
    - b. Decoustics Limited; a Saint Gobain company.
    - c. Wall Technology, Inc.; an Owens Corning company.
  2. Panel Shape: Flat.
  3. Mounting: Back mounted with manufacturer's standard perimeter adhesive and impaling clips, secured to substrate.
  4. Core: Glass-fiber board.
  5. Edge Construction: Manufacturer's standard chemically hardened core with no frame.
  6. Edge Profile: Square.
  7. Corner Detail in Elevation: Square with continuous edge profile indicated.
  8. Reveals between Panels: Flush reveals as indicated on Drawings.
  9. Facing Material: As scheduled in the Interior Finish Legend.
  10. Acoustical Performance: Sound absorption NRC of not less than 0.85 according to ASTM C 423 for Type A mounting according to ASTM E 795.
  11. Nominal Core Thickness: 1 1/16 inches .
  12. Panel Width: As indicated on Drawings.
  13. Panel Height: As indicated on Drawings.

## 2.4 MATERIALS

- A. Core Materials:
1. Glass-Fiber Board: ASTM C 612; of type standard with manufacturer; nominal density of 6 to 7 lb/cu. ft., unfaced, and dimensionally stable, molded rigid board; and with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- B. Mounting Devices: Concealed on back of unit, recommended by manufacturer to support weight of unit, and as follows:
1. Adhesives shall have a VOC content of 70 g/L or less.
  2. Impaling Clips: Manufacturer's standard.

## 2.5 FABRICATION

- A. Standard Construction: Use manufacturer's standard construction unless otherwise indicated; with facing material applied to face, edges, and back border of dimensionally stable core; and with rigid edges to reinforce panel perimeter against warpage and damage.
- B. Edge Hardening: For glass-fiber board cores, chemically harden core edges and areas of core where mounting devices are attached.
- C. Core-Face Layer: Evenly stretched over core face and edges and securely attached to core; free from puckers, ripples, wrinkles, or sags.
- D. Facing Material: Apply fabric facing fully covering visible surfaces of unit; with material stretched straight, on the grain, tight, square, and free from puckers, ripples, wrinkles, sags, blisters, seams, adhesive, or other visible distortions or foreign matter.
1. Square Corners: Tailor corners.
  2. Radius and Other Nonsquare Corners: Attach facing material so there are no seams or gathering of material.
  3. Fabrics with Directional or Repeating Patterns or Directional Weave: Mark fabric top and attach fabric in same direction so pattern or weave matches in adjacent units.

- E. Dimensional Tolerances of Finished Units: Plus or minus 1/16 inch for the following:
  - 1. Thickness.
  - 2. Edge straightness.
  - 3. Overall length and width.
  - 4. Squareness from corner to corner.
  - 5. Chords, radii, and diameters.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine fabric, fabricated units, substrates, areas, and conditions for compliance with requirements, installation tolerances, and other conditions affecting unit performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION**

- A. Install units in locations indicated. Unless otherwise indicated, install units with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.
- B. Comply with manufacturer's written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.
- C. Align fabric pattern and grain with adjacent units.

#### **3.3 INSTALLATION TOLERANCES**

- A. Variation from Plumb and Level: Plus or minus 1/16 inch in 48 inches , noncumulative.
- B. Variation of Joint Width: Not more than 1/16-inch variation from hairline in 48 inches , noncumulative.

#### **3.4 CLEANING**

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION



## **SECTION 09 84 33.13 - DETENTION SOUND-ABSORBING WALL UNITS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes shop-fabricated, acoustical panel units tested for acoustical performance, including the following:
  - 1. Sound-absorbing wall panels for detention areas.
- B. Related Requirements:
  - 1. Section 05 05 53 "Security Metal Fastenings" for acceptable fasteners.
  - 2. Section 07 92 16.13 "Detention Security Joint Sealants" for perimeter sealants.

#### **1.3 DEFINITIONS**

- A. NRC: Noise Reduction Coefficient.
- B. SAA: Sound Absorption Average.

#### **1.4 REFERENCE STANDARDS**

- A. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E 795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests.

#### **1.5 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.6 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include panel facing material, gage, core material, and mounting indicated.
- B. Shop Drawings: For unit assembly and installation.
  - 1. Include plans, elevations, sections, and mounting devices and details.
  - 2. Include details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate panel edge profile and core materials.
  - 3. Include details at cutouts and penetrations for other work.
  - 4. Include direction of perforation and pattern matching.
- C. Samples for Verification: For the following products:
  - 1. Color: Minimum 6 inch square Sample.
  - 2. Panel Edge: 12-inch- long Sample(s) showing each edge profile, corner, and finish.

## 1.7 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Electrical outlets, switches, and thermostats.
- B. Product Certificates: For each type of unit.
- C. Sample Warranty: For manufacturer's special warranty.

## 1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of unit to include in maintenance manuals.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and units in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

## 1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install units until a lighting level of not less than 50 fc is provided on surfaces to receive the units.
- C. Air-Quality Limitations: Protect units from exposure to airborne odors, such as tobacco smoke, and install units under conditions free from odor contamination of ambient air.
- D. Field Measurements: Verify unit locations and actual dimensions of openings and penetrations by field measurements before fabrication, and indicate them on Shop Drawings.

## 1.11 WARRANTY

- 1. Warranty Period: Two years from date of Substantial Completion.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Source Limitations: Obtain wall units specified in this Section from single source from single manufacturer.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Units shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. Surface-Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: 25 or less.
    - b. Smoke-Developed Index: 450 or less.

## 2.3 DETENTION SOUND-ABSORBING WALL UNITS

- A. Detention Sound-Absorbing Wall Panel: Manufacturer's standard panel construction consisting of perforated metal facing material enclosing glass fiber panels providing the specified acoustical properties.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Eckel Noise Control Technologies; Steel Eckel Correctional Panel Type-2 FE or comparable product by one of the following:
    - a. IAC Acoustics
    - b. Noise Barriers
    - c. Strike Industries, Inc.
  2. Panel Shape: Flat.
  3. Mounting: Bracket mounted to substrate.
  4. Core: Glass-fiber board or Mineral-fiber board..
  5. Edge Profile: Square .
  6. Corner Detail in Elevation: Square with continuous edge profile indicated.
  7. Facing Material: 16 gage zinc coated steel, perforated with 3/32 inch holes on 3/16 inch staggered centers
    - a. Finish: Polyurethane enamel paint; factory applied.
    - b. Color: As chosen by Architect from Manufacturer's full range.
  8. Nominal Panel Thickness: 2 1/8 inches.
  9. Panel Width: As indicated on Drawings.
  10. Panel Height: As indicated on Drawings.
  11. Panel Performance: Provide correctional panels that are certified to meet the following minimum sound absorption for an 18 inch by 96 inch panel, encapsulated in a 2 mil flame guard polyethylene, when tested in accordance with ASTM C 423
    - a. 125 Hz: 4.6 sabins.
    - b. 250 Hz: 9.6 sabins.
    - c. 500 Hz: 15.2 sabins.
    - d. 1000 Hz: 14.5 sabins
    - e. 2000 Hz: 12.6 sabins.
    - f. 4000 Hz: 11.1 sabins.

## 2.4 MATERIALS

- A. Core Materials:
1. Glass-Fiber Board: ASTM C 612; of type standard with manufacturer; nominal density of 6 to 7 lb/cu. ft., unfaced, and dimensionally stable, molded rigid board; and with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
  2. Mineral-Fiber Board: Maximum flame-spread and smoke-developed indexes of 25 and 10, respectively; minimum density of 13 lb/cu. ft., and with perforated surface.
- B. Facing Material: Galvanized steel, ASTM A653/A653M, with G90 coating; 0.064-inch nominal thickness.
- C. Mounting Devices: Concealed on back of unit, recommended by manufacturer to support weight of unit, and complying with Section 05 05 53 Security Metal Fastenings.
- D. Perimeter Sealant: As specified in Section 07 92 16.13.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine fabricated units, substrates, areas, and conditions for compliance with requirements, installation tolerances, and other conditions affecting unit performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION**

- A. Install units in locations indicated. Unless otherwise indicated, install units with vertical surfaces and edges plumb, top edges level and in alignment with other units, faces flush, and scribed to fit adjoining work accurately at borders and at penetrations.
- B. Comply with manufacturer's written instructions for installation of units using type of mounting devices indicated. Mount units securely to supporting substrate.
- C. Align pattern as indicated on Drawings.

#### **3.3 INSTALLATION TOLERANCES**

- A. Variation from Plumb and Level: Plus or minus 1/16 inch in 48 inches , noncumulative.
- B. Variation of Joint Width: Not more than 1/16-inch variation from reveal line in 48 inches , noncumulative.

#### **3.4 CLEANING**

- A. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION

## **SECTION 09 91 13 - EXTERIOR PAINTING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

##### **A. Section Includes:**

- 1. Primers.
- 2. Finish coatings.

##### **B. Related Requirements:**

- 1. Section 05 12 00 "Structural Steel Framing" for shop priming of metal substrates.
- 2. Section 05 50 00 "Metal Fabrications" for shop priming metal fabrications.

#### **1.3 ACTION SUBMITTALS**

##### **A. Product Data:** For each type of product.

- 1. Include preparation requirements and application instructions.
- 2. Indicate VOC content.

##### **B. Samples for Verification:** For each type of paint system and each color and gloss of topcoat.

- 1. Submit Samples on rigid backing, 8 inches square.
- 2. Apply coats on Samples in steps to show each coat required for system.

##### **C. Product Schedule:** Use same designations indicated on Drawings and in the Exterior Painting Schedule to cross-reference paint systems specified in this Section. Include color designations.

#### **1.4 MAINTENANCE MATERIAL SUBMITTALS**

##### **A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.**

- 1. Paint Products: 5 percent, but not less than 1 gal. of each material and color applied.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

##### **A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.**

- 1. Maintain containers in clean condition, free of foreign materials and residue.
- 2. Remove rags and waste from storage areas daily.

#### **1.6 FIELD CONDITIONS**

##### **A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.**

##### **B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.**

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Benjamin Moore & Co.
  - 2. Diamond Vogel Paints.
  - 3. PPG Paints.
  - 4. Pratt & Lambert.
  - 5. Sherwin-Williams Company (The).
- B. Source Limitations: Obtain each paint product from single source from single manufacturer.

### **2.2 PAINT PRODUCTS, GENERAL**

- A. Material Compatibility:
  - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
  - 2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.
- B. Colors: As indicated in Interior Finish Legend.
- C. Products: See schedule at end of this section.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

### **3.2 PREPARATION**

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems specified in this Section.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.

- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

### 3.3 INSTALLATION

- A. Apply paints in accordance with manufacturer's written instructions.
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
  - 3. Paint exterior side and edges of exterior doors and entire exposed surface of exterior door frames.
  - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  - 5. Primers specified in the Exterior Painting Schedule may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

### 3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
  - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
  - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
  - 3. Allow empty paint cans to dry before disposal.
  - 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.5 EXTERIOR PAINTING SCHEDULE

- A. Sherwin-Williams products listed for quality standard, unless otherwise indicated.

- B. Ferrous Metals:
  - 1. 1 coat primer (if un-primed) Pro-Cryl Universal Metal Primer B66-310 Series
  - 2. 2 coats Waterbased Acrolon 100 Water Based Urethane B65-720 Series
- C. Galvanized and Non-Ferrous Metal:
  - 1. Treat with appropriate cleansing agent
  - 2. 1 coat primer Pro-Cryl Universal Metal Primer B66-310 Series
  - 3. 2 coats Waterbased Acrolon 100 Water Based Urethane B65-720 Series
- D. Exterior Metal Bollards:
  - 1. 1 coat primer Macropoxy 646 Fast Cure Epoxy B58-600 Series
  - 2. 2 coats Hi-Solids Polyurethane Gloss B65-300 Series

END OF SECTION



## **SECTION 09 91 23 - INTERIOR PAINTING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
  - 1. Concrete masonry units (CMUs).
  - 2. Steel and iron.
  - 3. Gypsum board.
  - 4. Plaster.
- B. Related Requirements:
  - 1. Section 05 12 00 "Structural Steel Framing" for shop priming structural steel.
  - 2. Section 05 50 00 "Metal Fabrications" for shop priming metal fabrications.
  - 3. Section 05 51 13 "Metal Pan Stairs" for shop priming metal pan stairs.
  - 4. Section 05 52 13 "Pipe and Tube Railings" for shop priming pipe and tube railings.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
  - 1. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
  - 1. Submit Samples on rigid backing, 8 inches square.
  - 2. Apply coats on Samples in steps to show each coat required for system.
- C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

#### **1.4 MAINTENANCE MATERIAL SUBMITTALS**

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Paint: 1 gal. of each material and color applied.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

#### **1.6 FIELD CONDITIONS**

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Benjamin Moore & Co.
  - 2. Diamond Vogel Paints.
  - 3. PPG Architectural Coatings.
  - 4. Pratt & Lambert.
  - 5. Sherwin-Williams Company (The).
- B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.

### **2.2 PAINT, GENERAL**

- A. Material Compatibility:
  - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- B. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
  - 1. Flat Paints and Coatings: 50 g/L.
  - 2. Nonflat Paints and Coatings: 150 g/L.
  - 3. Dry-Fog Coatings: 400 g/L.
  - 4. Primers, Sealers, and Undercoaters: 200 g/L.
  - 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: 250 g/L.
  - 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
  - 7. Pretreatment Wash Primers: 420 g/L.
  - 8. Shellacs, Clear: 730 g/L.
  - 9. Shellacs, Pigmented: 550 g/L.
- C. Colors: As indicated in Interior Finish Legend.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Masonry (Clay and CMUs): 12 percent.
  - 2. Wood: 15 percent.
  - 3. Gypsum Board: 12 percent.
  - 4. Plaster: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Plaster Substrates: Verify that plaster is fully cured.

- E. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
  - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

### 3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
  - 1. Use applicators and techniques suited for paint and substrate indicated.
  - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  - 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
  - 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
  - 1. Paint the following work where exposed in equipment rooms:
    - a. Metal conduit.
    - b. Plastic conduit.
    - c. Tanks that do not have factory-applied final finishes.
  - 2. Paint the following work where exposed in occupied spaces:
    - a. Equipment, including panelboards.
    - b. Uninsulated metal piping.
    - c. Uninsulated plastic piping.
    - d. Pipe hangers and supports.
    - e. Metal conduit.
    - f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
    - g. Other items as directed by Architect.

#### 3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

#### 3.5 PAINT AND COATINGS SCHEDULE

- A. Sherwin-Williams products listed for quality standard, unless otherwise indicated.
- B. Surfaces to be painted are listed in the Interior Finish Legend, and indicated on the Drawings.
- C. CMU and Concrete:
  - 1. 1 coat PrepRite Blockfiller B25W25, tinted
  - 2. 2 coats Water Based Catalyzed Epoxy S/G B70/B60V25
- D. GWB and Plaster:
  - 1. 1 coat High Build Primer B28W8601
  - 2. 2 coats Water Based Catalyzed Epoxy S/G B70/B60V25
- E. CMU and Concrete:
  - 1. 1 coat PrepRite Blockfiller B25W25, tinted
  - 2. 2 coats ProMar 200 Zero VOC Interior Latex Eg-Shel B20-2600 Series
- F. GWB:
  - 1. 1 coat High Build Primer B28W8601
  - 2. 2 coats ProMar 200 Zero VOC Interior Latex Eg-Shel B20-2600 Series
- G. GWB (Deep Tone Colors):

1. 1 coat High Build Primer B28W8601, tinted with "P"-shade Color-Prime System
  2. 2 coats Duration Home Interior Latex Matte A96-100 Series
- H. Plaster:
1. 1 coat Premium Wall & Wood Primer B28W8111
  2. 2 coats ProMar 200 Zero VOC Interior Latex Eg-Shel B20-2600 Series
- I. Existing Painted CMU, Concrete, GWB, and Plaster:
1. 2 coats Water Based Catalyzed Epoxy S/G B70/B60V25 or ProMar 200 Zero VOC Interior Latex Eg-Shel B20-2600 Series as scheduled.
- J. Ferrous Metals, Primed Metal, Galvanized, and Non-Ferrous Metal:
1. 1 coat Pro-Cryl Universal Metal Primer B66-310 Series
  2. 2 coats ProClassic Interior Waterbased Acrylic-Alkyd Semi-Gloss B34W850 Series
- K. Painted (Opaque) Finish for Woodwork, Standing and Running Trim:
1. 1 coat primer PrepRite ProBlock Latex B51 Series
  2. 2 coats ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series
- L. Exposed Overhead Work:
1. 1 coat Pro-Cryl Universal Metal Primer B66-310 Series
  2. 2 coats Waterborne Acrylic Eg-Shel Dryfall B42W82
- 3.6 SCHEDULE OF MISCELLANEOUS FINISHES
- A. General:
1. Finish mechanical piping and electrical conduits, boxes; sprinkler piping and brackets; ductwork and accessories exposed in rooms and areas scheduled to receive wall and ceiling finishes with 2 spray finish coats of same material and color as adjacent surface, over appropriate primer.
  2. Finish miscellaneous steel joists, beams, deck, and other fabrications and shapes exposed in rooms and areas scheduled to receive wall and ceiling finishes with 2 spray coats over appropriate primer. See "Exposed Overhead Work" products specified above.
  3. Examine Drawings and Specifications for miscellaneous items indicated to be finished.
- B. Include the following:
1. Metal fabrications specified in Section 05 50 00 and 05 51 13.
  2. Metal railings specified in Section 05 52 13.
  3. Roof accessories specified in Section 07 72 00.
  4. New hollow metal doors and frames.
  5. Existing hollow metal doors and frames.
  6. Door and sidelight grilles.
  7. Access panels and frames specified in Section 08 31 13.
  8. Fire extinguisher cabinets specified in Section 10 00 10.
  9. Access panels specified in Divisions 22, 23, and 26.
  10. Cleanout access covers specified in Division 22.
  11. Surface raceways "Wiremold" specified in Division 26.
  12. Electrical panel board covers specified in Division 26.
- C. Obtain mechanical and electrical items noted above from respective contractors and spray paint prior to installation.
- D. Apply 2 spray coats ProClassic Interior Waterbased Acrylic-Alkyd Semi-Gloss B34W850 Series over appropriate primer to all miscellaneous finish work except as noted otherwise.

END OF SECTION

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## **SECTION 09 93 00 - STAINING AND TRANSPARENT FINISHING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Wood stains.
  - 2. Transparent finishes.
- B. Related Requirements:
  - 1. Section 09 91 23 "Interior Painting" for stains and transparent finishes on concrete floors.

#### **1.2 ACTION SUBMITTALS**

- A. Product Data:
  - 1. For each type of product.
  - 2. Include preparation requirements and application instructions.
  - 3. Indicate VOC content.
- B. Samples for Verification: Sample for each type of finish system and in each color and gloss of finish required on representative samples of actual wood substrates.
  - 1. Size: 8 inches square.
  - 2. Apply coats on Samples in steps to show each coat required for system.
  - 3. Label each coat of each Sample.
  - 4. Label each Sample for location and application area.
- C. Product List: Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

#### **1.3 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
  - 1. Maintain containers in clean condition, free of foreign materials and residue.
  - 2. Remove rags and waste from storage areas daily.

#### **1.4 FIELD CONDITIONS**

- A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply finishes when relative humidity exceeds 85 percent, at temperatures of less than 5 deg F above the dew point, or to damp or wet surfaces.
- C. Do not apply exterior finishes in snow, rain, fog, or mist.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Benjamin Moore & Co.
  - 2. Coronado Paint; Benjamin Moore & Co.
  - 3. Diamond Vogel Paints.
  - 4. PPG Paints.

5. Pratt & Lambert.
6. Sherwin-Williams Company (The).

## 2.2 SOURCE LIMITATIONS

- A. Source Limitations: Obtain each coating product from single source from single manufacturer.

## 2.3 MATERIALS, GENERAL

- A. Material Compatibility:
  1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- B. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
  1. Primers, Sealers, and Undercoaters: 100 g/L.
  2. Clear Wood Finishes, Varnishes: 275 g/L.
  3. Stains: 100 g/L.
- C. Stain Colors: Match existing, or if no existing remains, match Architect's samples.

## 2.4 WOOD STAINS

- A. Stain, Interior, Semitransparent, for Interior Wood: Solvent-based, oil or oil/alkyd, semitransparent, pigmented stain for new interior wood surfaces that are to be finished with a clear varnish.

## 2.5 TRANSPARENT FINISHES

- A. Varnish, Interior, Water Based, Clear, Semigloss: Water-based clear semigloss coating for interior wood trim, frames, etc.
  1. Gloss Level: Gloss of 35 to 70 units at 60 degrees when tested in accordance with ASTM D523.
- B. Varnish, Interior, Water Based, Clear, Semigloss Floor Finish: Water-based clear semigloss coating for interior wood stairs.
  1. Gloss Level: Gloss of 35 to 70 units at 60 degrees when tested in accordance with ASTM D523.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Exterior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Maximum Moisture Content of Interior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with finish application only after unsatisfactory conditions have been corrected.



1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

### 3.2 PREPARATION

- A. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
  1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- B. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.
  1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
  2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
- C. Interior Wood Substrates:
  1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
  2. Apply wood filler paste to open-grain woods to produce smooth, glasslike finish.
  3. Sand surfaces exposed to view and dust off.
  4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dry.

### 3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions.
  1. Use applicators and techniques suited for finish and substrate indicated.
  2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
  3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

### 3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

### 3.5 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. Wood Substrates, Wood Trim and Architectural Woodwork:
  1. Water-Based Varnish over Stain System:

- a. Stain Coat: Stain, semitransparent, for interior wood.
  - b. First Intermediate Coat: Water-based varnish matching topcoat.
  - c. Topcoat: Varnish, water based, clear, semigloss.
- B. Wood Substrates, Traffic Surfaces, Including Stairs:
  - 1. Moisture-Cured Clear Polyurethane over Stain System:
    - a. Stain Coat: Stain, semitransparent, for interior wood.
    - b. First Intermediate Coat: Moisture-cured polyurethane matching topcoat.
    - c. Topcoat: Varnish, polyurethane, moisture cured, gloss.

END OF SECTION

## **SECTION 09 96 00 - HIGH-PERFORMANCE COATINGS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes surface preparation and the application of high-performance coating systems on the following substrates:
  - 1. Interior Substrates:
    - a. Concrete, vertical and horizontal surfaces.
    - b. Concrete masonry units (CMUs).
- B. Related Requirements:
  - 1. Section 09 91 23 "Interior Painting" for general field painting.

#### **1.3 REFERENCES**

- A. This Section contains references to the governing standards and documents listed below. They are a part of this Section as specified and modified; the current version shall apply unless otherwise noted. In case of conflict between the requirements of this section and those of the listed documents, the more stringent of the requirements shall prevail.
- B. ASTM International (ASTM):
  - 1. ASTM D 16 - Terminology Relating to Paint, Varnish, Lacquer, and Related Products.
  - 2. ASTM D 4263 - Indicating Moisture in Concrete by the Plastic Sheet Method.
  - 3. ASTM D 6386 - Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
  - 4. ASTM F 1869 - Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- C. NACE International (NACE):
  - 1. NACE 6 • Surface Preparation of Concrete.
- D. SSPC: The Society of Protective Coatings (SSPC):
  - 1. SSPC-SP 13 • Surface Preparation of Concrete.
  - 2. SSPC-PA2 • Measurement of Dry Coating with Magnetic Gauges.
- E. International Concrete Restoration Institute (ICRI):
  - 1. ICRI No. 037332 Selecting and Specifying Concrete Surface Preparation for Sealers, coatings, and Polymer Overlays, CSP1-9.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Verification: For each type of coating system and each color and gloss of topcoat indicated.
  - 1. Submit Samples on rigid backing, 12 inches square.
  - 2. Apply coats on Samples in steps to show each coat required for system.
  - 3. Label each coat of each Sample.

4. Label each Sample for location and application area.
- C. Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.
- 1.5 MAINTENANCE MATERIAL SUBMITTALS
  - A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
    1. Coatings: 5 percent, but not less than 1 gal. of each material and color applied.
- 1.6 DELIVERY, STORAGE, AND HANDLING
  - A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
    1. Maintain containers in clean condition, free of foreign materials and residue.
    2. Remove rags and waste from storage areas daily.
- 1.7 FIELD CONDITIONS
  - A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.
  - B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

## **PART 2 - PRODUCTS**

- 2.1 HIGH-PERFORMANCE COATINGS
  - A. Seamless Epoxy System (Finish Code HPC1): Integrated system for floors, walls and ceilings consisting of 100 percent solids accelerated aliphatic amine cured epoxy with chopped strand fiberglass and Kevlar reinforcement and an integrated anti-microbial glaze top coat.
- 2.2 MANUFACTURERS
  - A. Basis-of-Design Product: Subject to compliance with requirements, provide Tnemec Company, Inc.; Correctional Facility Shower system or equivalent system by the following:
    1. Prime Coat Coating Systems
    2. Sika Corporation
  - B. Labels of each container shall identify the manufacturer's name, product name and number, component description, color, and instructions for reducing, where applicable.
- 2.3 PERFORMANCE REQUIREMENTS
  - A. Product Composition: Coating systems shall be 100 percent solids with fiberglass strand or mat reinforcing. Fiberglass strands shall be sufficient enough to form a reinforced matrix/web within the resin providing the following performance requirements.
    1. Compressive Strength: Minimum 11,700 psi per ASTM D 695.
    2. Tensile Strength: Minimum 3,900 psi per ASTM D 638.
    3. Hardness: Minimum 80 per ASTM D 2240, Shore D Durometer.
    4. Abrasion Resistance: Minimum 0.03 gm/1000 revolutions per ASTM D 4060 Taber Abrader.
    5. Adhesion: Exceeds the cohesive strength of concrete (400 psi) per ASTM D7234 or D4541.
    6. Static Coefficient of Friction (Floors only): Minimum 0.69 per ASTM D2047.
    7. Scrub Resistance: Maximum 80 mg loss after 1,000 cycles per ASTM D4213.

## 2.4 COATING SYSTEMS FOR CONCRETE AND MASONRY - INTERIOR

### A. Shower Walls - Spray Applied System

1. System Type: Fiberglass Reinforced Epoxy/Ceramic Modified Water-Based Polyurethane
2. Surface Preparation: SSPC-SP13/NACE 6, Concrete shall be mechanically abraded to a minimum ICRI-CSP3-4
3. Surface Filler: Series 1254 Epoxoblock WB applied at 80 -120 SFPG.
4. Patching Compound: Series 215 Surfacing Epoxy applied as needed to fill voids.
5. Body Coat: Series 270 Stranlok applied at 25.0 - 40.0 mils DFT.
6. Glaze Coat: Series 280 Theme-Glaze applied at 6.0 - 8.0 mils DFT.
7. Optional Finish Coat: Series 297 Enviro-Glaze (gloss), DFT 2.0 to 3.0 mils.
8. Finish Color:
  - a. As scheduled in Interior Finish Legend.

## 2.5 COATING SYSTEM FOR SHOWER CEILING

### A. Shower Ceilings

1. System Type: Epoxy/Ceramic Modified Water-Based Polyurethane
2. Surface Preparation: Clean and Dry.
3. Primer: Series 280 Theme-Glaze applied at 6.0 - 8.0 mils DFT.
4. Finish Coat: Series 297 Enviro-Glaze applied at 2.0 - 3.0 mils DFT.
5. Finish Color:
  - a. As scheduled in Interior Finish Legend.

## 2.6 COATING SYSTEMS FOR CONCRETE SHOWER FLOORS

### A. Shower Floor - Above Grade

1. System Type: Pigmented Epoxy Laminate/Modified Polyaspartic/Polyurethane
2. Surface Preparation: Shot Blast or Mechanically Abrade - ICRI CSP 3-4.
3. Coving: Series 237 or 238 Power-Tread (pigmented, mixed as a mortar) applied to form a 1 inch cant cove.
4. Primer: Series 201 Epoxoprime applied at 4.0 - 6.0 mils DFT.
5. Waterproofing Membrane: Series 206 Sub-Flex EP applied at 30.0 - 80.0 mils DFT.
6. Body Coat(s): Series 237 or 238 Power-Tread (pigmented, double broadcast or slurry/broadcast), DFT 1/8 inch.
7. Grout Coat: Series 237 or 238 Power-Tread (pigmented) applied at 8.0 - 16.0 mils DFT.
8. Finish Coat: Series 297 Enviro-Glaze (pigmented, gloss) applied at 2.0 - 3.0 mils DFT.
9. Total DFT: Nominal 1/8 inch system.
10. Finish Color:
  - a. As scheduled in Interior Finish Legend.

### B. Shower Floors - On Grade

1. System Type: Pigmented Epoxy Laminate/Ceramic Modified Water-Based Polyurethane
2. Surface Preparation: Shot Blast or Mechanically Abrade - ICRI CSP 3-4.
3. Cove: Series 237 or 238 Power-Tread (pigmented, mixed as a mortar) applied to form a 1 inch cant cove.
4. Body Coat: Series 241 Ultra-Tread MVT (slurry/broadcast), DFT 1/8 inch.
5. Grout Coat: Series 237 or 238 Power-Tread (pigmented) applied at DFT 8.0 - 16.0 mils DFT.
6. Finish Coat: Series 297 Enviro-Glaze (pigmented, gloss) applied at 2.0 - 3.0 mils DFT.
7. Total DFT: Nominal 1/8 inch system.
8. Finish Color:
  - a. As scheduled in Interior Finish Legend.

## 2.7 ACCESSORIES

- A. Equipment: Application equipment is not required to be new, but shall be adequate for the work and workmanship required herein.
- B. Accessories: Include all required ladders, scaffolding, drop cloths, masking, scrapers, tools, dusters, cleaning solvents, and waste, as required to perform the Work and achieve the results herein specified.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
  - 1. Concrete: 12 percent.
  - 2. Masonry (Clay and CMUs): 12 percent.
  - 3. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
  - 1. Application of coating indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and coating systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
  - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
  - 1. Abrasive blast clean surfaces to comply with SSPC-SP 7/NACE No. 4 or as directed by the manufacturer.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or alkalinity of mortar joints exceeds that permitted in manufacturer's written instructions.
  - 1. Clean surfaces as specified in Section 04 20 00.

### 3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
  - 1. Use applicators and techniques suited for coating and substrate indicated.
  - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
  - 4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
- C. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections.

### 3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION

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## **DIVISION 10**



## **SECTION 10 00 10 - MISCELLANEOUS SPECIALTIES**

### **PART 1 - PART ONE - GENERAL**

#### **1.1 DESCRIPTION**

- A. Section Includes:
  - 1. Fire extinguisher cabinets
  - 2. Curtain track and break-a-way curtain
  - 3. Fiberglass Planters

#### **1.2 RELATED WORK AND REQUIREMENTS**

- A. Applicable provisions of Division 01 shall govern Work of this Section.

#### **1.3 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver items to job site at appropriate times to be incorporated in the Work.
- B. Store items subject to damage in appropriately protected areas.

### **PART 2 - PRODUCTS**

#### **2.1 FIRE EXTINGUISHER CABINETS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. JL Industries, Inc.
  - 2. Larsen's Manufacturing Company
  - 3. Modern Metal Products
  - 4. Nystrom, Inc.
  - 5. Potter Roemer
- B. FEC-1: Equivalent to Larsen's Architectural Series Model 2409-6R, vertical duo door style glazed with fully-tempered glass, semi-recessed, inside box dimensions 9-1/2 inches W x 6 inches D x 24 inches H, factory primed and field painted to match adjacent surfaces.
- C. FEC-2: Equivalent to Larsen's Architectural Series Model 2409-SM, vertical duo door style glazed with fully-tempered glass, surface mounted, inside box dimensions 13 inches W x 6 inches D x 27-1/2 inches H, factory primed and field painted to match adjacent surfaces.

#### **2.2 CURTAIN TRACK AND BREAK-A-WAY CURTAIN**

- A. Imperial Fastener Company specified to establish type and standard of quality. Equivalent products manufactured by General Cubicle Company and Pryor Products also acceptable.
- B. Break-A-Way Track: Imperial IFC-69 surface ceiling mounted aluminum cubicle track with 3/4-inch wide x 4-inch long Safety Tabs (3 per foot of curtain), and other track accessories as required for secure and operational installation. Track Finish: Clear satin anodized.
- C. Break-A-Way Shower Curtain: Provide Sure-Chek nylon reinforced vinyl with top 20 inches of curtain of #50 open nylon mesh and 20 inches clear vinyl bottom panel. Fabricate curtain width equal to track length plus 6-inches added fullness and length equal to floor-to-track height minus 2-inches. Fabricate top hem 1-1/2 inches wide, double lock stitched, and 1-1/2 inch wide loop tape double lock stitched to top hem.
- D. Vinyl and Mesh Colors: As selected by A/E from manufacturer's full range.

### 2.3 FIBERGLASS PLANTERS

- A. Fiberglass Planters: Glass fiber reinforced polyester resin constructed of hand or spray layup fiberglass mat, minimum 3 ounce density, Tournesol Siteworks, LLC; Wilshire Collection or equivalent.
  - 1. Size: As indicated on Drawings.
  - 2. Color: To be chosen by Architect from Manufacturer's full range.

### 2.4 MATERIALS

- A. Provide rough and miscellaneous hardware such as expansion bolts, strap anchors and hardware required in connection with work of this Section.
- B. Finish all ferrous metal with approved shop prime coat.

### 2.5 FABRICATION

- A. Schedule items for fabrication so as to avoid delay in delivery to site at appropriate time to incorporate into the Work.
- B. Do necessary cutting, drilling and fitting, and make proper allowance for incorporating items into or against other work.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Field Measurements and Verification: Verify all dimensions at the building and examine all adjoining work to ensure surfaces are ready to accept items.

### 3.2 COORDINATION

- A. Cooperate with and coordinate work with other trades whose work interfaces with or comes in contact with items specified herein.

### 3.3 INSTALLATION/APPLICATION/ERECTION

- A. Install, apply, and erect all items in accordance with manufacturer's recommendations for specific condition involved.
- B. Install plumb, square, level, in proper alignment, and secure with appropriate devices, suitable for the specific condition involved.
- C. Furnish items to be built into other work to appropriate trades.
- D. Do not install scratched, marred or otherwise damaged items. Replace damaged items at no cost to Owner.

End of Section

## **SECTION 10 11 00 - VISUAL DISPLAY UNITS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Visual display board assemblies.
  - 2. Rail support system for visual display board assemblies.
- B. Related Requirements:
  - 1. Section 10 00 10 "Miscellaneous Specialties" for tackboards within display cases.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Visual display board assemblies.
  - 2. Rail support system for visual display board assemblies.
- B. Shop Drawings: For visual display units.
  - 1. Include plans, elevations, sections, details, and attachment to other work.
  - 2. Show locations of panel joints.
  - 3. Include sections of typical trim members.
- C. Samples for Initial Selection: For each type of visual display unit indicated, for units with factory-applied color finishes, and as follows:
  - 1. Fabric swatches of fabric facings for tackboards.
  - 2. Include accessory Samples to verify color selected.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For visual display units to include in maintenance manuals.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

#### **1.6 FIELD CONDITIONS**

- A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: 25 or less.

2. Smoke-Developed Index: 450 or less.
  - B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 2.2 VISUAL DISPLAY BOARD ASSEMBLIES
- A. Visual Display Board Assemblies: .
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. ASI Visual Display Products.
      - b. Claridge Products and Equipment, Inc.
      - c. Nudo.
  - B. Visual Display Board Assembly: Factory fabricated.
    1. Assembly: markerboard and tackboard.
    2. Corners: Rounded.
    3. Width: As indicated on Drawings.
    4. Height: As indicated on Drawings.
    5. Mounting Method: Rail support system.
  - C. Markerboard Panel: Porcelain-enamel-faced markerboard panel on core indicated.
    1. Color: White.
  - D. Tackboard Panel: Vinyl-fabric-faced tackboard panel on core indicated.
    1. Fabric Wrapped Edge: Wrap edge of tackboard panel with fabric facing.
    2. Color and Pattern: As selected by Architect from full range of industry colors.
  - E. Aluminum Frames and Trim: Fabricated from not less than 0.062-inch- thick, extruded aluminum; standard size and shape.
    1. Field-Applied Trim: Manufacturer's standard, snap-on trim with no visible screws or exposed joints.
    2. Aluminum Finish: Clear anodic finish.
  - F. Chalktray: Manufacturer's standard; continuous.
    1. Solid Type: Extruded aluminum with ribbed section and smoothly curved exposed ends.
- 2.3 RAIL SUPPORT SYSTEM FOR VISUAL DISPLAY BOARD ASSEMBLIES
- A. Support Rails: Horizontal, wall-mounted, extruded-aluminum rails designed to receive hanger clip and to support visual display boards.
    1. Finish: Clear anodic.
  - B. Hanger Clips: Extruded aluminum with finish to match rails; designed to support independent visual display board assemblies by engaging support rail and top trim of board.
- 2.4 MARKERBOARD PANELS
- A. Porcelain-Enamel Markerboard Panels: Balanced, high-pressure, factory-laminated markerboard assembly of three-ply construction, consisting of moisture-barrier backing, core material, and porcelain-enamel face sheet with low-gloss finish. Laminate panels under heat and pressure with manufacturer's standard, flexible waterproof adhesive.
    1. Face Sheet Thickness: 0.021 inch uncoated base metal thickness.
    2. Manufacturer's Standard Core: Minimum 1/4 inch thick, with manufacturer's standard moisture-barrier backing.

## 2.5 TACKBOARD PANELS

- A. Tackboard Panels:
  - 1. Facing:
    - a. Vinyl fabric.
  - 2. Core:
    - a. Manufacturer's standard.

## 2.6 MATERIALS

- A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.
- B. Vinyl Fabric: Mildew resistant, washable, complying with ASTM F793/F793M, Type II, burlap weave; weighing not less than 13 oz./sq. yd.; with surface-burning characteristics indicated.
- C. Composite Wood Products: Products shall be made without urea formaldehyde.
- D. MDF: ANSI A208.2, Grade 130.
- E. Extruded Aluminum: ASTM B221, Alloy 6063.

## 2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA AMP 500 for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.8 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motorized, sliding visual display units.
- C. Examine walls and partitions for proper preparation and backing for visual display units.
- D. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.

- B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the performance of and affect the smooth, finished surfaces of visual display boards.
- C. Prepare recesses for sliding visual display units as required by type and size of unit.

### 3.3 INSTALLATION

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Factory-Fabricated Visual Display Board Assemblies:
  - 1. Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.
- C. Visual Display Board Assembly Mounting Heights: Install visual display units at mounting heights indicated on Drawings, or if not indicated, at heights indicated below.
  - 1. Mounting Height: 36 inches above finished floor to top of chalktray.

### 3.4 CLEANING AND PROTECTION

- A. Clean visual display units in accordance with manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.
- C. Cover and protect visual display units after installation and cleaning.

END OF SECTION



## **SECTION 10 14 00 - SIGNAGE**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Interior code-required signage.
  - 2. Exterior code-required signage.

#### **1.2 SUBMITTALS**

- A. Product Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of signs. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, reinforcement, accessories, layout, and installation details.
  - 1. Provide message list for each sign required, including large-scale details of wording and lettering layout.
  - 2. Furnish full-size spacing templates for individually mounted dimensional letters and numbers.
  - 3. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors to be installed as a unit of Work in other Sections.
- C. Samples: Submit samples of each sign type for verification of color, pattern, and surface texture:
  - 1. Photopolymer/plastic: Samples of each finish type and color on 6 inch x 8 inch sections. Where finishes involve normal color and texture variations include sample sets showing the full range of variations expected.
  - 2. Aluminum: Samples of each finish type and color, on 6 inch long sections of extrusions and not less than 4 inch squares of sheet or plate. Where finishes involve normal color and texture variations include sample sets showing the full range of variations expected.
  - 3. Dimensional Letters: Provide full-size representative samples of each dimensional letter type required showing letter style, color, and material finish and include method of attachment materials.
  - 4. Die-cut vinyl characters and graphic symbols.

#### **1.3 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- C. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA), ICC/ANSI A117.1, and with code provisions as adopted by the State of Wisconsin and local authorities having jurisdiction, whichever are more stringent.

#### **1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Package and label all signage as to type and location. Include complete installation instructions.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Aluminum Sheet: Provide aluminum sheet of alloy and temper recommended by the sign manufacturer for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 209 for 5005-H15.
- B. Aluminum Extrusions: Provide aluminum extrusions of alloy and temper recommended by the sign manufacturer for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.
- C. Aluminum Castings: Provide aluminum castings of alloy and temper recommended by the sign manufacturer for the casting process used and for the use and finish indicated.
- D. Fasteners: Unless otherwise indicated, used concealed fasteners fabricated from metals that are non-corrosive to either the sign material or the mounting surface.
- E. Anchors and Inserts: Use non-corrosive anchors and inserts for exterior installations as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors.

### **2.2 INTERIOR SIGNAGE**

- A. Marking and Identification: Permanently mark and identify with signs or stenciling fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations in accordance with requirements of Section 703.7 of the 2015 IBC.
- B. Sign Types:
  - 1. Regulatory: Tactile ADA Restrooms, Elevators, Elevator Equipment Rooms, Stairs, etc. 12 inches x 6 inches. Occupancy load signage for assembly occupancy rooms or spaces.
  - 2. Equivalent to the following:
    - a. Manufacturer: ASI Sign Systems, 4214 Park Glen Road, Minneapolis, MN. 55416
    - b. Style: ASIInTouch ADA-Ready
    - c. Sign Face: Photopolymer acrylic, .125 inch thick, matte first surface.
    - d. Applied Lettering and Numerals: Acrylic, Dimensional Characters. Individual cut acrylic letters (1/32" thick) with matte finish.
    - e. Color: Background of Sign: As selected by A/E from manufacturer's full range.
    - f. Text or Pictogram: As selected by A/E from manufacturer's full range.
    - g. Text: Helvetica Medium, Upper Case Letters, followed by Grade 2 Braille.
    - h. Characters: Raised 1/32 inch off sign surface, all caps, Grade 2 Braille.
    - i. Mounting Type: Double stick "VHB" foam tape. Locate 60 inches to center of sign, 3 inches from latch side of door.

### **2.3 FABRICATION**

- A. General: Provide signs of configurations indicated.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturers instructions.
- B. Install signs level, plumb and at the height indicated, with sign surfaces free from distortion or other defects in appearance.

### 3.3 CLEANING AND PROTECTION

- A. At completion of the installation, clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Owner.

### 3.4 SCHEDULE

- A. Provide signage as noted below.
  - 1. Fire Department Cabinets, Equipment, Alarm and Protection per IBC 905.7.1, 907.4.2.4, and 912.5
  - 2. At each restroom provide (1) 12 inch x 6 inch regulatory sign with raised pictogram and text "Men", "Women", or "Family" with Braille.
  - 3. At each stair on the outside of the stair door provide (1) 6 inch x 8 inch sign with pictogram and text "Stair".
  - 4. At each floor landing inside a Stairway provide a 12 inch by 18 inch sign complying with the requirements of Section 1023.9 of the 2015 IBC.
  - 5. At each elevator, provide one 6 inch x 8 inch sign with raised pictogram and text "Elevator" including Braille characters.
  - 6. At each dwelling unit, provide one 6 inch by 4 inch sign with raised text and Braille indicating unit number.
  - 7. Provide as necessary per Building Code, signs that indicate "Area of Rescue Assistance" in text and Braille characters.
  - 8. At each egress stairway, exit passageway and exit discharge provide one tactile exit sign complying with Section 703 of ICC/ANSI A117.1, including both raised lettering and Braille.

END OF SECTION

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## **SECTION 10 21 13.13 - METAL TOILET COMPARTMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Painted steel toilet compartments configured as toilet enclosures and urinal screens.
- B. Related Requirements:
  - 1. Section 06 10 00 "Rough Carpentry" for blocking.
  - 2. Section 10 28 00 "Toilet, Bath, and Laundry Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories mounted on toilet compartments.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.
- B. Shop Drawings: For toilet compartments.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Show locations of cutouts for compartment-mounted toilet accessories.
  - 3. Show locations of reinforcements for compartment-mounted grab bars and locations of blocking for surface-mounted toilet accessories.
  - 4. Show locations of centerlines of toilet fixtures.
  - 5. Show locations of floor drains.
  - 6. Show overhead support or bracing locations.
- C. Samples for Initial Selection: For each type of toilet compartment material indicated.
  - 1. Include Samples of hardware and accessories involving material and color selection.
- D. Product Schedule: For toilet compartments, prepared by or under the supervision of supplier, detailing location and selected colors for toilet compartment material.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For toilet compartments to include in maintenance manuals.

#### **1.5 PROJECT CONDITIONS**

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

### **PART 2 - PRODUCTS**

#### **2.1 PERFORMANCE REQUIREMENTS**

- A. Regulatory Requirements: Comply with applicable provisions in ICC A117.1 for toilet compartments designated as accessible.

## 2.2 PAINTED STEEL TOILET COMPARTMENTS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Accurate Partitions Corp., an ASI Group Company.
  2. Bradley Corporation.
  3. Global Partitions Corp., an ASI Group Company.
  4. Knickerbocker Partition Corporation.
  5. Metpar Corp.
- B. Toilet-Enclosure Style: Overhead braced, Floor anchored. Urinal-Screen Style: Wall hung, flat panel.
- C. Door, Panel, and Pilaster Construction: Seamless, metal facing sheets pressure laminated to core material; with continuous, interlocking molding strip or lapped-and-formed edge closures; corners secured by welding or clips and exposed welds ground smooth. Provide with maximum privacy, no-sightline system. Exposed surfaces shall be free of pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections.
1. Core Material: Manufacturer's standard sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch for doors and panels and 1-1/4 inches for pilasters.
  2. Grab-Bar Reinforcement: Provide concealed internal reinforcement for grab bars mounted on units of size and material adequate for panel to withstand applied downward load on grab bar of at least 250 lbf, when tested according to ASTM F446, without deformation of panel.
  3. Tapping Reinforcement: Provide concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to units.
- D. Urinal-Screen Construction:
1. Flat-Panel Urinal Screen: Matching panel construction.
- E. Facing Sheets and Closures: Electrolytically coated steel or hot-dip galvanized-steel sheet with nominal base-metal (uncoated) thicknesses as follows:
1. Pilasters, Braced at Both Ends: Manufacturer's standard thickness, but not less than 0.036 inch.
  2. Pilasters, Unbraced at One End: Manufacturer's standard thickness, but not less than 0.048 inch.
  3. Panels: Manufacturer's standard thickness, but not less than 0.030 inch.
  4. Doors: Manufacturer's standard thickness, but not less than 0.030 inch.
  5. Flat-Panel Urinal Screens: Thickness matching the panels.
- F. Pilaster Shoes and Sleeves (Caps): Stainless steel sheet, not less than 0.031-inch nominal thickness and 3 inches high, finished to match hardware.
- G. Brackets (Fittings):
1. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.
- H. Steel Sheet Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-on finish, including thermosetting, electrostatically applied, and powder coatings. Comply with coating manufacturer's written instructions for applying and baking.
1. Color: As selected by Architect from manufacturer's full range.
    - a. Allow for application of one color in each room.

## 2.3 HARDWARE AND ACCESSORIES

- A. Hardware and Accessories: Manufacturer's heavy-duty operating hardware and accessories.

1. Hinges: Manufacturer's minimum 0.062-inch- thick, stainless steel continuous, cam type that swings to a closed or partially open position, allowing emergency access by lifting door. Mount with through-bolts.
  2. Latch and Keeper: Manufacturer's heavy-duty, surface-mounted, cast stainless steel latch unit designed to resist damage due to slamming, with combination rubber-faced door strike and keeper and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through-bolts.
  3. Coat Hook: Manufacturer's heavy-duty, combination cast stainless steel hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories. Mount with through-bolts.
  4. Door Bumper: Manufacturer's heavy-duty, rubber-tipped, cast stainless steel bumper at out-swinging doors. Mount with through-bolts.
  5. Door Pull: Manufacturer's heavy-duty cast stainless steel pull at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through-bolts.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

## 2.4 MATERIALS

- A. Aluminum Extrusions: ASTM B221.
- B. Steel Sheet: Commercial steel sheet for exposed applications; mill phosphatized and selected for smoothness.
1. Electrolytically Zinc Coated: ASTM A879/A879M, 01Z.
  2. Hot-Dip Galvanized: ASTM A653/A653M, either hot-dip galvanized or galvanized.
- C. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.
- D. Stainless Steel Castings: ASTM A743/A743M.

## 2.5 FABRICATION

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories, and solid blocking within panel where required for attachment of toilet accessories.
- B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Door Size and Swings: Unless otherwise indicated, provide 24-inch- wide, in-swinging doors for standard toilet compartments and 36-inch- wide, out-swinging doors with a minimum 32-inch- wide, clear opening for compartments designated as accessible.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
  - 1. Confirm location and adequacy of blocking and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Coordinate layout and installation of supports, inserts, and anchors built into other units of work for toilet compartment anchorage.

### **3.2 INSTALLATION**

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position indicated with manufacturer's recommended anchoring devices.
  - 1. Maximum Clearances:
    - a. Pilasters and Panels: 1/2 inch.
    - b. Panels and Walls: 1 inch.
  - 2. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.
    - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
    - b. Align brackets at pilasters with brackets at walls.
- B. Overhead-Braced Units: Secure pilasters to floor and level, plumb, and tighten. Set pilasters with anchors penetrating not less than 1-3/4 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure continuous head rail to each pilaster with no fewer than two fasteners. Hang doors to align tops of doors with tops of panels, and adjust so tops of doors are parallel with overhead brace when doors are in closed position.
- C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

### **3.3 ADJUSTING**

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION



## **SECTION 10 22 13 - WIRE MESH PARTITIONS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Standard-duty wire mesh partitions.
- B. Related Requirements:
  - 1. Section 05 05 53 "Security Metal Fastenings" for fasteners associated with heavy-duty wire mesh partitions and mini mesh chain link fabric ceilings.

#### **1.2 DEFINITIONS**

- A. Intermediate Crimp: Wires pass over one and under the next adjacent wire in both directions, with wires crimped before weaving and with extra crimps between the intersections.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data:
  - 1. Wire mesh partitions.
- B. Shop Drawings:
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Indicate clearances required for operation of doors.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For wire mesh partition hardware.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver wire mesh items palletized to provide protection during transit and Project-site storage. Use vented plastic.

#### **1.6 FIELD CONDITIONS**

- A. Field Measurements: Verify actual dimensions of construction contiguous with wire mesh units by field measurements before fabrication.

### **PART 2 - PRODUCTS**

#### **2.1 SOURCE LIMITATIONS**

- A. For wire mesh products, obtain each color, grade, finish, type, and variety from single source with resources to provide products of consistent quality in appearance and physical properties.

#### **2.2 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Wire mesh units to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
  - 1. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft. at any location on a panel.
  - 2. Total load of 200 lbf applied uniformly over each panel.
  - 3. Concentrated load and total load need not be assumed to act concurrently.

- B. Regulatory Requirements: Comply with applicable provisions in ICC A117.1 for doors and gates designated as accessible.

## 2.3 STANDARD-DUTY WIRE MESH PARTITIONS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Acorn Wire & Iron Works.
  - 2. American Woven Wire Corporation.
  - 3. Central Wire and Iron.
  - 4. Indiana Wire Products, Inc.
  - 5. Standard Wire & Steel Works.
  - 6. WireCrafters, LLC.
- B. Mesh: 0.135-inch- diameter, intermediate-crimp steel wire woven into 1-1/2-inch diamond mesh.
- C. Horizontal Panel Framing: 1-by-1/2-by-1/8-inch cold-rolled steel channels.
- D. Horizontal Panel Stiffeners: Two cold-rolled steel channels, 3/4 by 3/8 by 1/8 inch, bolted or riveted toe to toe through mesh; or one 1-by-1/2-by-1/8-inch cold-rolled steel channel with wire mesh woven through channel.
- E. Posts for 90-Degree Corners: 1-1/4-by-1-1/4-by-1/8-inch steel angles or square tubes with holes for 1/4-inch- diameter bolts aligning with bolt holes in vertical framing; with floor anchor clips.
- F. Line Posts: 3-inch-by-4.1-lb or 3-1/2-by-1-1/4-by-0.127-inch steel channels; with 1/4-inch steel base plates.
- G. Three-Way Intersection Posts: 1-1/4-by-1-1/4-by-1/8-inch steel tubes or channels, with holes for 1/4-inch- diameter bolts aligned for bolting to adjacent panels.
- H. Floor Shoes: Metal, not less than 2 inches high; sized to suit vertical framing, drilled for attachment to floor, and with setscrews for leveling adjustment.
- I. Swinging Doors: Fabricated from same mesh as partitions, with framing fabricated from 1-1/4-by-1/2-by-1/8-inch steel channels or 1-1/4-by-5/8-by-0.080-inch cold-rolled, C-shaped steel channels, banded with 1-1/4-by-1/8-inch flat steel bar cover plates on three sides, and with 1/8-inch- thick angle strike bar and cover on strike jamb.
  - 1. Hinges: Full-surface type, 3-by-3-inch steel, three per door; bolted, riveted, or welded to door and jamb framing.
  - 2. Cylinder Lock: Mortise type with cylinder specified in Section 08 71 00 "Door Hardware"; operated by key outside and lever inside.
- J. Accessories:
  - 1. Adjustable Filler Panels: 0.060-inch- thick, steel sheet; capable of filling openings from 2 to 12 inches.
  - 2. Wall Clips: Manufacturer's standard, steel sheet; allowing up to 1 inch of adjustment.
  - 3. Aluminum-Coated Steel Chain Link Fence Fabric complying with ASTM A491.

## 2.4 MATERIALS

- A. Steel Wire: ASTM A510/A510M.
- B. Steel Plates, Channels, Angles, and Bars: ASTM A36/A36M.
- C. Steel Sheet: Cold-rolled steel sheet, ASTM A1008/A1008M, Commercial Steel (CS), Type B.
- D. Steel Pipe: ASTM A53/A53M, Schedule 40, unless another weight is indicated or required by structural loads.

- E. Steel Tubing: ASTM A500/A500M, cold-formed structural-steel tubing or ASTM A513/A513M, Type 5, mandrel-drawn mechanical tubing.
- F. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B; with G60 zinc (galvanized) or A60 zinc-iron-alloy (galvannealed) coating designation.
- G. Panel-to-Panel Fasteners: Manufacturer's standard steel bolts, nuts, and washers.
- H. Post-Installed Anchors: Capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
  - 1. Material for Interior Locations: Carbon-steel components are zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
- I. Power-Driven Fasteners: ICC-ES AC70.
- J. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

## 2.5 FABRICATION

- A. General: Fabricate wire mesh items from components of sizes not less than those indicated. Use larger-sized components as recommended by wire mesh item manufacturer. Furnish bolts, hardware, and accessories required for complete installation with manufacturer's standard finishes.
  - 1. Fabricate wire mesh items to be readily disassembled.
- B. Standard- Duty Wire Mesh Partitions: Fabricate wire mesh partitions with cutouts for pipes, ducts, beams, and other items indicated. Finish edges of cutouts to provide a neat, protective edge.
  - 1. Mesh: Securely clinch mesh to framing.
  - 2. Framing: Fabricate framing with mortise-and-tenon corner construction.
    - a. Provide horizontal stiffeners as indicated or, if not indicated, as required by panel height and as recommended by wire mesh partition manufacturer. Weld horizontal stiffeners to vertical framing.
    - b. Fabricate three- and four-way intersections using manufacturer's standard connecting clips and fasteners.
    - c. Fabricate partition and door framing with slotted holes for connecting adjacent panels.
  - 3. Fabricate wire mesh partitions with 3 to 4 inches of clear space between finished floor and bottom horizontal framing.
  - 4. Fabricate wire mesh partitions with bottom horizontal framing flush with finished floor.
  - 5. Doors: Align bottom of door with bottom of adjacent panels.
    - a. For doors that do not extend full height of partition, provide transom over door, fabricated from same mesh and framing as partition panels.
  - 6. Hardware Preparation: Mortise, reinforce, drill, and tap doors and framing as required to install hardware.
- C. Wire Mesh Ceilings: Fabricate wire mesh partitions with cutouts for pipes, ducts, beams, and other items indicated. Finish edges of cutouts to provide a neat, protective edge.
  - 1. Mesh: Securely clinch mesh to framing.
  - 2. Framing: Fabricate framing with mortise-and-tenon corner construction.
    - a. Provide stiffeners as indicated or, if not indicated, as required by panel span and as recommended by wire mesh ceiling manufacturer. Weld stiffeners to framing.

## 2.6 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine floors for suitable conditions where wire mesh items will be installed.
- C. Examine walls to which wire mesh items will be attached for properly located blocking, grounds, and other solid backing for attachment of support fasteners.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION OF WIRE MESH PARTITIONS

- A. Anchor wire mesh partitions to floor with 3/8-inch- diameter, postinstalled expansion anchors at 12 inches o.c. through anchor clips located at each post and corner. Shim anchor clips as required to achieve level and plumb installation.
  - 1. Anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if indicated on Shop Drawings.
- B. Anchor wire mesh partitions to walls at 12 inches o.c. through back corner panel framing and as follows:
  - 1. For concrete and solid masonry anchorage, use expansion anchors.
  - 2. For hollow masonry anchorage, use toggle bolts.
  - 3. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.
- C. Where standard-width wire mesh partition panels do not fill entire length of run, provide adjustable filler panels to fill openings.
- D. Install doors complete with door hardware.
- E. Bolt accessories to wire mesh partition framing.

### 3.3 REPAIR

- A. Repair of Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

### 3.4 ADJUSTING

- A. Adjust doors to operate smoothly and easily, without binding or warping. Adjust hardware to function smoothly. Verify that latches and locks engage accurately and securely without forcing or binding.

### 3.5 PROTECTION

- A. Remove and replace defective work, including doors and framing that are warped, bowed, or otherwise unacceptable.

END OF SECTION

## **SECTION 10 22 39 - FOLDING PANEL PARTITIONS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Manually operated, acoustical panel partitions.
- B. Related Requirements:
  - 1. Section 05 50 00 "Metal Fabrications" for supports that attach supporting tracks to overhead structural system.
  - 2. Section 09 29 00 "Gypsum Board" for fire-rated assemblies and sound barrier construction above the ceiling at track.
  - 3. Electrical and communications Sections for electrical service and connections for motor operators, controls, and limit switches and for system disconnect switches.

#### **1.2 DEFINITIONS**

- A. NIC: Noise Isolation Class.
- B. NRC: Noise Reduction Coefficient.
- C. STC: Sound Transmission Class.

#### **1.3 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For operable panel partitions.
  - 1. Include plans, elevations, sections, attachment details, and numbered panel installation sequence.
  - 2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
- C. Samples for Initial Selection: For each type of exposed material, finish, covering, or facing.
  - 1. Include Samples of accessories involving color selection.
- D. Delegated Design Submittal: For operable panel partitions.
  - 1. Include design calculations for seismic restraints that brace tracks to structure above.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Partition track, track supports and bracing, switches, turning space, and storage layout.
  - 2. Suspended ceiling components.
  - 3. Structural members to which suspension systems will be attached.
  - 4. Size and location of initial access modules for acoustical tile.
  - 5. Items penetrating finished ceiling including the following:
    - a. Lighting fixtures.
    - b. HVAC ductwork, outlets, and inlets.
    - c. Speakers.

- d. Sprinklers.
  - e. Smoke detectors.
  - f. Access panels.
  - g. Other ceiling penetrating items that may interfere with movement of panels.
- 6. Plenum acoustical barriers.
- B. Setting Drawings: For embedded items and cutouts required in other work, including support-beam, mounting-hole template.
- C. Product Test Reports: For each operable panel partition, for tests performed by a qualified testing agency.
- D. Sample Warranty: For manufacturer's special warranty.
- 1.6 CLOSEOUT SUBMITTALS
  - A. Operation and Maintenance Data: For operable panel partitions to include in maintenance manuals.
    - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
      - a. Panel finish facings and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
      - b. Seals, hardware, track, track switches, carriers, and other operating components.
- 1.7 QUALITY ASSURANCE
  - A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- 1.8 DELIVERY, STORAGE, AND HANDLING
  - A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.
- 1.9 WARRANTY
  - A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
    - 1. Failures include, but are not limited to, the following:
      - a. Faulty operation of operable panel partitions.
      - b. Deterioration of metals, metal finishes, and other materials beyond normal use.
    - 2. Warranty Period: Two years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

- 2.1 PERFORMANCE REQUIREMENTS
  - A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design seismic bracing of tracks to structure above.
  - B. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
    - 1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E90, determined by ASTM E413, and rated for not less than the STC indicated.

2. Noise-Reduction Requirements: Operable panel partition assembly, identical to partition tested for STC, tested for sound-absorption performance according to ASTM C423, and rated for not less than the NRC indicated.
  3. Noise-Isolation Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC according to ASTM E336, determined by ASTM E413, and rated for 10 dB less than STC value indicated.
- C. Fire-Test-Response Characteristics: Provide panels with finishes complying with one of the following as determined by testing identical products by a testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: 25 or less.
    - b. Smoke-Developed Index: 450 or less.
  2. Fire Growth Contribution: Complying with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 265 Method B Protocol NFPA 286.

## 2.2 OPERABLE ACOUSTICAL PANELS

- A. Operable Acoustical Panels: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories.
1. Manufacturers: Subject to compliance with requirements, provide Modernfold, Inc.; Acousti-Seal Premier Series Partitions or equivalent products by one of the following:
    - a. Hufcor, Inc.
    - b. Moderco Inc.
- B. Panel Operation at Offset-Loading Partition in Board Room: Manually operated, individual .
- C. Panel Operation at All Other Locations: Manually operated, paired panels.
- D. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- E. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
1. Panel Width: Equal widths.
- F. STC: Not less than 50.
- G. Panel Thickness: Nominal dimension of 3 inches.
- H. Panel Materials:
1. Composite Wood Products: Products shall be made without urea formaldehyde.
  2. Steel Frame: Steel sheet, manufacturer's standard nominal minimum thickness for uncoated steel.
  3. Steel Face/Liner Sheets: Tension-leveled steel sheet, manufacturer's standard minimum nominal thickness for uncoated steel.
  4. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; ASTM B221 for extrusions; manufacturer's standard strengths and thicknesses for type of use.
    - a. Frame Reinforcement: Manufacturer's standard steel or aluminum.
  5. Medium-Density Fiberboard: ANSI A208.2.

- I. Panel Closure: Manufacturer's standard unless otherwise indicated.
    - 1. Initial Closure: Fixed jamb.
    - 2. Final Closure: Constant-force, lever-operated mechanical closure expanding from panel edge to create a constant-pressure acoustical seal Insert description.
  - J. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.
    - 1. Hinges: Manufacturer's standard.
  - K. Finish Facing: Vinyl-coated fabric wall covering.
- 2.3 SEALS
- A. Description: Seals that produce operable panel partitions complying with performance requirements and the following:
    - 1. Manufacturer's standard seals unless otherwise indicated.
    - 2. Seals made from materials and in profiles that minimize sound leakage.
    - 3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
  - B. Horizontal Top Seals: Continuous-contact, resilient seal exerting uniform constant pressure on track.
  - C. Horizontal Bottom Seals:
    - 1. Mechanically Operated for Acoustical Panels: Extension and retraction of bottom seal by operating handle or built-in operating mechanism, with operating range not less than 2 inches between retracted seal and floor finish.
- 2.4 PANEL FINISH FACINGS
- A. Description: Finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.
    - 1. Apply one-piece, seamless facings free of air bubbles, wrinkles, blisters, and other defects, with no gaps or overlaps. Tightly secure and conceal raw and selvage edges of facing for finished appearance.
    - 2. Where facings with directional, repeating, or matching grain are indicated, mark facing top and attach facing in same direction.
    - 3. Match facing pattern 72 inches above finished floor.
  - B. Vinyl-Coated Fabric Wall Covering: Manufacturer's standard, mildew-resistant, washable, vinyl-coated fabric wall covering; complying with WA-101, Type III-Heavy Duty; Class A.
    - 1. Total Weight: 30 oz. per lineal yard.
    - 2. Antimicrobial Treatment: Additives capable of inhibiting growth of bacteria, fungi, and yeasts.
    - 3. Color/Pattern: As selected by Architect from manufacturer's full range.
  - C. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.
- 2.5 SUSPENSION SYSTEMS
- A. Basis-of Design: Modernfold, Inc.; #17 Bracket Mounted Track, or equivalent.



- B. Tracks: Steel or aluminum with adjustable steel hanger rods for overhead support, designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than 0.10 inch between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
  - 1. Panel Guide: Aluminum guide on both sides of the track to facilitate straightening of the panels; finished with factory-applied, decorative, protective finish.
  - 2. Head Closure Trim: As required for acoustical performance; with factory-applied, decorative, protective finish.
- C. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
  - 1. Multidirectional Carriers: Capable of negotiating intersections without track switches.
- D. Track Intersections, Switches, and Accessories: As required for operation, storage, track configuration, and layout indicated for operable panel partitions, and compatible with partition assembly specified. Fabricate track intersections and switches from steel or aluminum.
  - 1. T Intersections: Allow panels to pass through or change 90 degrees to another direction of travel.
- E. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

## 2.6 ACCESSORIES

- A. Pass Doors: Swinging door built into and matching panel materials, construction, acoustical qualities, finish and thickness, complete with frames and operating hardware. Hinges finished to match other exposed hardware.
  - 1. Accessibility Standard: Fabricate doors to comply with applicable provisions in ICC A117.1.
  - 2. Single Pass Door: 36 by 84 inches.
  - 3. Pass-Door Hardware: Equip pass door with the following:
    - a. Door Seals: Mechanically operated floor seal on panels containing pass doors.
    - b. Panic hardware.
    - c. Concealed door closer.
    - d. Exit Sign: Recessed, self-illuminated.
    - e. Latchset: Passage set.
- B. Storage Pocket Door: Full height at end of partition runs to conceal stacked partition; of same materials, finish, construction, thickness, and acoustical qualities as panels; complete with operating hardware and acoustical seals at soffit, floor, and jambs. Hinges in finish to match other exposed hardware.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine flooring, floor levelness, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.
- B. Install panels in numbered sequence indicated on Shop Drawings.
- C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.
- D. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.
- E. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals.

### 3.3 ADJUSTING

- A. Adjust operable panel partitions, hardware, and other moving parts to function smoothly, and lubricate as recommended by manufacturer.
- B. Adjust pass doors and storage pocket doors to operate smoothly and easily, without binding or warping.
- C. Verify that safety devices are properly functioning.

### 3.4 MAINTENANCE SERVICE

- A. Maintenance Service: Beginning at Substantial Completion, maintenance service is to include 12 months' full maintenance by manufacturer's authorized service representative. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operable-partition operation. Parts and supplies are to be manufacturer's authorized replacement parts and supplies.

### 3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION

## **SECTION 10 28 00 - TOILET, BATH, AND LAUNDRY ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Public-use washroom accessories.
  - 2. Toilet-compartment occupancy-indicator systems.
  - 3. Public-use shower room accessories.
  - 4. Childcare accessories.
  - 5. Custodial accessories.
- B. Related Requirements:
  - 1. Section 08 80 00 "Glazing" for frameless mirrors.
  - 2. Section 10 21 13.13 "Metal Toilet Compartments" for combination door stops and coat hooks on metal toilet compartment doors.
  - 3. Section 10 28 13.63 "Detention Toilet Accessories" for accessories designed for installation in detention facilities.

#### **1.3 COORDINATION**

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
  - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
  - 1. Identify locations using room designations indicated.
  - 2. Identify accessories using designations indicated.
- C. Delegated-Design Submittal: For grab bars and shower seats.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For accessories to include in maintenance manuals.

## **PART 2 - PRODUCTS**

### **2.1 OWNER-FURNISHED MATERIALS**

- A. Owner-Furnished Materials: As indicated in keynote legend on Drawings. Coordinate openings and blocking requirements with Owner.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Design accessories and fasteners to comply with the following requirements:
  - 1. Grab Bars: Installed units are able to resist 250 lbf concentrated load applied in any direction and at any point.
  - 2. Shower Seats: Installed units are able to resist 250 lbf applied in any direction and at any point.

### **2.3 PUBLIC-USE WASHROOM ACCESSORIES**

- A. Source Limitations: Obtain each type of public-use washroom accessory from single source from single manufacturer.
- B. Acceptable Manufacturers:
  - 1. Manufacturers: American Specialties, Inc products specified to establish level of quality. Subject to compliance with requirements, provide products by one of the following:
    - a. American Specialties, Inc.
    - b. Bobrick Washroom Equipment, Inc.
    - c. Bradley Corporation.
- C. Toilet Tissue (Roll) Dispensers:
  - 1. Description: Double-roll dispenser; ASI 0031 (recessed wall mounted), and enclosed double-roll dispenser; ASI 0032 (double-sided partition mounted).
  - 2. Mounting: Partition mounted, serving two adjacent toilet compartments and Surface mounted.
  - 3. Operation: Eccentric-shaped, molded-plastic spindle revolves one-half revolution per dispensing operation for controlled delivery; core cannot be removed until roll is empty.
  - 4. Capacity: Designed for 4-1/2- or 5-inch- diameter tissue rolls.
  - 5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
- D. Grab Bar:
  - 1. Mounting: Flanges with concealed fasteners.
  - 2. Material: Stainless steel, 0.05 inch thick.
    - a. Finish: Smooth, ASTM A480/A480M No. 4 finish (satin).
  - 3. Outside Diameter: 1-1/2 inches.
  - 4. Configuration and Length: As indicated on Drawings.
- E. Sanitary-Napkin and Tampon Vendor :
  - 1. Description: Provide ASI Series 0464 Napkin/Tampon Vendor
  - 2. Mounting: Semirecessed.
  - 3. Capacity: 30 sanitary napkins and 27 tampons.
  - 4. Operation: Coordinate vending cost requirements with Owner.
  - 5. Exposed Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
  - 6. Lockset: Tumbler type with separate lock and key for coin box.
- F. Sanitary-Napkin Disposal Unit :
  - 1. Description: Provide ASI 0472 and 0473.

2. Mounting: Partition mounted, dual access and Surface mounted.
3. Door or Cover: Self-closing, disposal-opening cover.
4. Receptacle: Removable.
5. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

G. Hook :

1. Description: Double-prong unit.
2. Mounting: Concealed.
3. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

## 2.4 PUBLIC-USE SHOWER ROOM ACCESSORIES

A. Source Limitations: Obtain each type of public-use shower room accessory from single source from single manufacturer.

B. Shower Curtain Rod :

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Specialties, Inc.
  - b. Bobrick Washroom Equipment, Inc.
  - c. Bradley Corporation.
2. Description: 1-1/4-inch- outside diameter, straight rod.
3. Configuration: As indicated on Drawings
4. Mounting Flanges: Concealed fasteners; in material and finish matching rod.
5. Rod Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

C. Shower Curtain :

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Specialties, Inc.
  - b. Bobrick Washroom Equipment, Inc.
  - c. Bradley Corporation.
2. Size: Minimum 12 inches wider than opening by 72 inches high.
3. Material: Vinyl, minimum 0.006 inch thick, opaque, matte.
4. Color: White.
5. Grommets: Corrosion resistant at minimum 6 inches o.c. through top hem.
6. Shower Curtain Hooks: Chrome-plated or stainless steel, spring wire curtain hooks with snap fasteners, sized to accommodate specified curtain rod. Provide one hook per curtain grommet.

D. Folding Shower Seat :

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Specialties, Inc.
  - b. Bobrick Washroom Equipment, Inc.
  - c. Bradley Corporation.
2. Configuration: L-shaped seat, designed for wheelchair access.
3. Seat: Phenolic or polymeric composite of slat-type or one-piece construction in color as selected by Architect.
4. Mounting Mechanism: Stainless steel, ASTM A480/A480M No. 4 finish (satin).

## 2.5 CHILDCARE ACCESSORIES

A. Source Limitations: Obtain childcare accessories from single source from single manufacturer.

B. Diaper-Changing Station :

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Specialties, Inc.
  - b. Bradley Corporation.
  - c. GAMCO Specialty Accessories; a division of Bobrick.
  - d. Koala Kare Products; a Division of Bobrick.
2. Description: Unit that opens by folding down from stored position and with child-protection strap.
  - a. Engineered to support minimum of 250-lb static load when opened.
3. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed or Semirecessed, with unit projecting not more than 1 inch from wall when closed.
4. Operation: By pneumatic shock-absorbing mechanism.
5. Material and Finish: HDPE in manufacturer's standard color.
6. Liner Dispenser: Provide built-in dispenser for disposable sanitary liners.

2.6 CUSTODIAL ACCESSORIES

A. Source Limitations: Obtain custodial accessories from single source from single manufacturer.

B. Custodial Mop and Broom Holder :

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Specialties, Inc.
  - b. Bobrick Washroom Equipment, Inc.
  - c. Bradley Corporation.
2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
3. Length: 36 inches.
4. Hooks: Four.
5. Mop/Broom Holders: Three, spring-loaded, rubber hat, cam type.
6. Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
  - a. Shelf: Not less than nominal 0.05-inch- thick stainless steel.
  - b. Rod: Approximately 1/4-inch- diameter stainless steel.

2.7 MATERIALS

- A. Stainless Steel: ASTM A240/A240M or ASTM A666, Type 304, 0.031-inch- minimum nominal thickness unless otherwise indicated.
- B. Steel Sheet: ASTM A1008/A1008M, Designation CS (cold rolled, commercial steel), 0.036-inch- minimum nominal thickness.
- C. Galvanized-Steel Sheet: ASTM A653/A653M, with G60 hot-dip zinc coating.
- D. Galvanized-Steel Mounting Devices: ASTM A153/A153M, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

2.8 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
  - 1. Remove temporary labels and protective coatings.
- B. Grab Bars: Install to comply with specified structural-performance requirements.
- C. Shower Seats: Install to comply with specified structural-performance requirements.

#### **3.2 ADJUSTING AND CLEANING**

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION

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## **SECTION 10 28 13.63 - DETENTION TOILET ACCESSORIES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Safety hooks.
  - 2. Toilet Tissue Holder.
  - 3. Stainless-steel mirrors.
  - 4. Grab bars.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for Detention Equipment Contractor requirements.
  - 2. Section 10 28 00 "Toilet, Bath, and Laundry Accessories" for nondetention toilet accessories.

#### **1.3 COORDINATION**

- A. Detention Equipment Contractor: Coordinate with Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for requirements of this Section that are to be performed by a Detention Equipment Contractor or other entity.
- B. Coordinate installation of anchorages for detention toilet accessories. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in adjoining construction. Deliver such items to Project site in time for installation.
- C. Coordinate size and location of recesses in wall construction to receive recessed detention toilet accessories.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Product Schedule: For detention toilet accessories. Indicate types, quantities, sizes, and installation locations by room of each accessory required.

#### **1.6 INFORMATIONAL SUBMITTALS**

- A. Coordination Drawings: Location of each built-in anchor supporting detention toilet accessories, including anchors to be installed as work of other Sections, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Locations, dimensions, and profiles of wall and floor reinforcements.
  - 2. Locations and installation details of built-in anchors.

3. Elevations of each detention toilet accessory showing dimensions of accessory, preparations for receiving anchors, and locations of anchorage.
  4. Details of attachment of each detention toilet accessory to built-in anchors.
- B. Examination reports documenting inspection of substrates, areas, and conditions.
  - C. Anchor inspection reports documenting inspections of built-in and cast-in anchors.
  - D. Field quality-control certification signed by Contractor and Detention Equipment Contractor.
- 1.7 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For detention toilet accessories to include in maintenance manuals.
- 1.8 WARRANTY
- A. Special Warranty: Manufacturer agrees to repair or replace detention toilet accessories that fail in materials or workmanship within specified warranty period.
    1. Failures include, but are not limited to, the following:
      - a. Structural failures including deflection exceeding 1/4 inch.
      - b. Faulty operation of hardware.
      - c. Deterioration of metals, metal finishes, and other materials.
    2. Warranty Period: Two years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

- 2.1 DETENTION SAFETY HOOKS
- A. Individual, Straight, Detention Safety Hook: 3/8-inch- diameter, stainless-steel straight hook held by 0.109-inch- thick, stainless-steel mounting plate approximately 4 inches square. Provide pivoting assembly that maintains pressure on hook and snaps down when load exceeds 15 lbf.
    1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - a. AJW Architectural Products.
      - b. American Specialties, Inc.
      - c. Bobrick Washroom Equipment, Inc.
      - d. Bradley Corporation.
      - e. PSI LLC.
      - f. Southern Folger Detention Equipment Company.
      - g. Willoughby Industries.
    2. Mounting: Front mounting with security fasteners.
  - B. Materials:
    1. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
  - C. Stainless-Steel Finish:
    1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
    2. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
      - a. Run grain of directional finishes with long dimension of each piece.
      - b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
      - c. Directional Satin Finish: No. 4.

## 2.2 TOILET TISSUE HOLDER

- A. Recessed, Detention Toilet Tissue Holder: Minimum 5-inch diameter by 4-1/2 inches deep; formed from 0.062-inch- thick, stainless-steel sheet. Secure to wall with detention fasteners complying with Section 05 05 53.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. AJW Architectural Products.
    - b. American Specialties, Inc.
    - c. Bradley Corporation.
    - d. PSI LLC.
    - e. Willoughby Industries.
  - 2. Face: 7-inch square integral face plate.
- B. Materials:
  - 1. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
- C. Stainless-Steel Finish:
  - 1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
  - 2. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
    - a. Run grain of directional finishes with long dimension of each piece.
    - b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
    - c. Directional Satin Finish: No. 4.

## 2.3 DETENTION MIRRORS

- A. Small, Integrally Framed Detention Mirror: Mirror and integral frame formed from a single sheet of 0.062-inch- thick, stainless steel; with round corners.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Specialties, Inc.
    - b. PSI LLC.
    - c. Willo Products Company, Inc.
    - d. Willoughby Industries.
  - 2. Size: Approximately 9-1/2 by 11 inches.
  - 3. Mounting: Front mounting with security fasteners to 0.168-inch nominal-thickness, metallic-coated steel mounting plate.
- B. Materials:
  - 1. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, CS (Commercial Steel), Type B; with G60 zinc (galvanized) coating designation.
  - 2. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
- C. Finishes:
  - 1. Metallic-Coated Steel Sheet Finish:

- a. Surface Preparation: Clean surfaces of oil and other contaminants. Use cleaning methods that do not leave residue. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A 780/A 780M.
2. Stainless-Steel Finish:
  - a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
  - b. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
    - 1) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
    - 2) Mirrorlike Reflective, Nondirectional Polish: No. 8.
3. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

#### 2.4 DETENTION GRAB BARS

- A. Grab Bars: 1-1/2 inches in diameter; formed from 0.038-inch- thick, stainless-steel tubing, with 3-inch- diameter flanges formed from 0.125-inch- thick, stainless steel. Closure plates formed from 0.125-inch- thick, stainless steel. All-welded construction.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. AJW Architectural Products.
    - b. American Specialties, Inc.
    - c. Bradley Corporation.
    - d. PSI LLC.
    - e. Willoughby Industries.
  2. Length: As indicated on Drawings.
  3. Mounting: Front mounting with security fasteners.
- B. Materials:
  1. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
  2. Stainless-Steel Tubing: ASTM A 1016/A 1016M, austenitic stainless steel, Type 304, seamless.
- C. Stainless-Steel Finish:
  1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
  2. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
    - a. Run grain of directional finishes with long dimension of each piece.
    - b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
    - c. Directional Satin Finish: No. 4.

#### 2.5 FABRICATION

- A. Coordinate dimensions and attachment methods of detention toilet accessories with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.
- B. Shear and punch metals cleanly and accurately. Remove burrs.

- C. Form edges and corners to be free of sharp edges and rough areas. Fold back exposed edges of unsupported sheet metal to form a 1/2-inch- wide hem on the concealed side, or ease edges to a radius of approximately 1/32 inch and support with concealed stiffeners.
  - D. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
  - E. Weld corners and seams continuously to comply with referenced AWS standard and the following:
    - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    - 2. Obtain fusion without undercut or overlap.
    - 3. Remove welding flux immediately.
    - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
    - 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
  - F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure detention toilet accessories rigidly in place and to support expected loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.
  - G. Cut, reinforce, drill, and tap detention toilet accessories to receive hardware, security fasteners, and similar items.
  - H. Form exposed work true to line and level with accurate angles and surfaces. Grind off and ease edges unless otherwise indicated.
  - I. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed security fasteners of type indicated or, if not indicated, flat-head (countersunk) security fasteners. Locate joints where least conspicuous.
- 2.6 ACCESSORIES
- A. Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.
  - B. Cast-in-Place Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified testing agency; of type indicated below:
    - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed; hot-dip galvanized according to ASTM A 153/A 153M or ASTM F 2329/F 2329M.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention toilet accessories.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention toilet accessories.

- C. Verify locations of detention toilet accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry or similar construction.
- B. Apply security sealant around perimeter in a continuous ribbon on back of detention toilet accessories before installation.
- C. Grab Bars: Install to withstand a downward load of not less than 250 lbf per ASTM F 446.

### 3.3 FIELD QUALITY CONTROL

- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
- B. Remove and replace detention work where inspections indicate that work does not comply with specified requirements.
- C. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- D. Prepare field quality-control certification endorsed by Detention Equipment Contractor that states installed products and their installation comply with requirements in the Contract Documents.

### 3.4 ADJUSTING AND CLEANING

- A. Remove temporary labels and protective coatings.
- B. Adjust curved safety hooks to release with application of 15 lbf load.
  - 1. Verify tightness of accessible connections by calibrated torque driver.

END OF SECTION

## **SECTION 10 51 13 - METAL LOCKERS**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Welded athletic lockers.
  - 2. Locker benches.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker and bench.
- B. Shop Drawings: For metal lockers.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Show locker trim and accessories.
  - 3. Include locker identification system and numbering sequence.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Sample Warranty: For special warranty.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

#### **1.7 FIELD CONDITIONS**

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

#### **1.8 COORDINATION**

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

#### **1.9 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
  - 1. Failures include, but are not limited to, the following:

- a. Structural failures.
  - b. Faulty operation of latches and other door hardware.
2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for Welded Metal Lockers: 10 years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Source Limitations: Obtain metal lockers, locker benches, and accessories from single source from single locker manufacturer.
  1. Obtain locks from single lock manufacturer.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. Accessibility Standard: For lockers and locker benches indicated to be accessible, comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

### **2.3 WELDED ATHLETIC LOCKERS (Locker Type 1)**

- A. Manufacturers: Subject to compliance with requirements, provide Republic Storage Systems, LLC; Single Point II Ventilated Lockers or equivalent products by one of the following:
  1. AJW Architectural Products.
  2. ASI Storage Solutions.
  3. Olympus Lockers & Storage Products, Inc.
  4. Penco Products, Inc.
- B. Perforated Doors: One piece; fabricated from 0.075-inch nominal-thickness steel sheet with manufacturer's standard diamond perforations; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.
  1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches wide; welded to inner face of doors.
- C. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
  1. Tops and Bottoms: 0.060-inch nominal thickness, with single bend at edges.
  2. Backs: 0.048-inch nominal thickness.
  3. Shelves: 0.060-inch nominal thickness, with double bend at front and single bend at sides and back.
- D. Unperforated Sides: Fabricated from 0.048-inch nominal-thickness steel sheet.
- E. Frames: Channel formed; fabricated from 0.060-inch nominal-thickness steel sheet or 0.097-inch nominal-thickness steel angles; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.
- F. Reinforced Bottoms: Structural channels, formed from 0.060-inch nominal-thickness steel sheet; welded to front and rear of side-panel frames.
- G. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.
  1. Continuous Hinges: Manufacturer's standard, steel; side or top mounted as required by locker configuration.



- H. Recessed Door Handle and Latch: Stainless steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.
    - 1. Single-Point Latching: Nonmoving latch hook with steel padlock loop that projects through recessed cup and is finished to match metal locker body.
      - a. Latch Hook: Equip each door with one latch hook, fabricated from 0.120-inch nominal-thickness steel sheet; welded midway up full-height door strike; with resilient silencer.
  - I. Locks: Combination padlocks.
  - J. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch high.
  - K. Hooks: Manufacturer's standard ball-pointed, aluminum or steel; zinc plated.
  - L. Continuous Zee Base: 4 inches high; fabricated from 0.075-inch nominal-thickness steel sheet.
  - M. Recess Trim: Fabricated from 0.048-inch nominal-thickness steel sheet.
  - N. Filler Panels: Fabricated from 0.048-inch nominal-thickness steel sheet.
  - O. Finished End Panels: Fabricated from 0.024-inch nominal-thickness steel sheet to cover unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.
  - P. Materials:
    - 1. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
  - Q. Finish: Baked enamel or powder coat.
    - 1. Color: As selected by Architect from manufacturer's full range.
- 2.4 LOCKS
- A. Combination Padlock: Provided by Owner.
- 2.5 LOCKER BENCHES
- A. Provide bench units with overall assembly height of 17-1/2 inches.
  - B. Bench Tops: Manufacturer's standard one-piece units, with rounded corners and edges.
    - 1. Size: Minimum 9-1/2 inches wide by 1-1/4 inches thick except provide 20- to 24-inch-wide tops where accessible benches are indicated.
    - 2. Laminated clear hardwood with one coat of clear sealer on all surfaces and one coat of clear lacquer on top and sides.
  - C. Fixed-Bench Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors, and as follows:
    - 1. Tubular Steel:
      - a. 1-1/2-inch- diameter steel tubing threaded on both ends, with standard pipe flange at top and bell-shaped cast-iron base; with baked-enamel or powder-coat finish; anchored with exposed fasteners.
  - D. Materials:
    - 1. Steel Tube: ASTM A500/A500M, cold rolled.
    - 2. Composite Wood Products: Products shall be made without urea formaldehyde.
    - 3. Particleboard: ANSI A208.1, Grade M-2.

## 2.6 FABRICATION

- A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
  - 1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.
  - 2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.
- B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments.
- C. Equipment: Provide each locker with an identification plate and the following equipment:
  - 1. Single-Tier Units: Shelf, one double-prong ceiling hook, and two single-prong wall hooks.
- D. Welded Construction: Factory preassemble metal lockers by welding all joints, seams, and connections; with no bolts, nuts, screws, or rivets used in assembly of main locker groups. Factory weld main locker groups into one-piece structures. Grind exposed welds smooth and flush.
- E. Accessible Lockers: Fabricate as follows:
  - 1. Locate bottom shelf no lower than 15 inches above the floor.
  - 2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches above the floor.
- F. Continuous Zee Base: Fabricated in lengths as long as practical to enclose base and base ends; finished to match lockers.
- G. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.
- H. Finished End Panels: Fabricated to conceal unused penetrations and fasteners, except for perimeter fasteners, at exposed ends of nonrecessed metal lockers; finished to match lockers.
  - 1. Provide one-piece panels for double-row (back-to-back) locker ends.
- I. Center Dividers: Full-depth, vertical partitions between bottom and shelf; finished to match lockers.

## 2.7 ACCESSORIES

- A. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.
- B. Anchors: Material, type, and size required for secure anchorage to each substrate.
  - 1. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls for corrosion resistance.
  - 2. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine walls and floors or support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install lockers level, plumb, and true; shim as required, using concealed shims.
  - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
  - 2. Anchor single rows of metal lockers to walls near top and bottom of lockers.
- B. Welded Lockers: Connect groups together with manufacturer's standard fasteners, with no exposed fasteners on face frames.
- C. Equipment:
  - 1. Attach hooks with at least two fasteners.
  - 2. Attach door locks on doors using security-type fasteners.
  - 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
    - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
- D. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
  - 1. Attach recess trim to recessed metal lockers with concealed clips.
  - 2. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.
  - 3. Attach finished end panels using fasteners only at perimeter to conceal exposed ends of nonrecessed metal lockers.
- E. Fixed Benches: Provide no fewer than two pedestals for each bench, uniformly spaced not more than 72 inches apart. Securely fasten tops of pedestals to undersides of bench tops, and anchor bases to floor.

### 3.3 ADJUSTING

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

### 3.4 PROTECTION

- A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.
- B. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION

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## **SECTION 10 51 29 - PHENOLIC LOCKERS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Locker units with hinged doors.
  - 2. Filler panels.
  - 3. Hooks, latches, and hardware.
  - 4. Attachment hardware.

#### **1.3 SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of locker .
- B. Shop Drawings: For phenolic lockers.
  - 1. Include locker types, sizes, and configurations.
  - 2. Include plans, elevations, sections, and attachment details.
  - 3. Show locker trim and accessories.
  - 4. Include locker identification system and numbering sequence.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.
- D. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

#### **1.4 QUALITY ASSURANCE**

- A. Engage an experienced Installer who is approved by the locker manufacturer for installation of the type of lockers required for this Project.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver lockers until building is enclosed and ready for locker installation. Protect from damage during delivery, handling, storage, and installation.

#### **1.6 FIELD CONDITIONS**

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

#### **1.7 COORDINATION**

- A. Coordinate sizes and locations of wood bases for lockers.
- B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that lockers can be supported and installed as indicated.

## 1.8 WARRANTY

- A. Manufacturer agrees to repair or replace components of lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
- B. Failures include, but are not limited to, the following:
  - 1. Structural failures.
  - 2. Delamination.
  - 3. Faulty operation of latches and other door hardware.
- C. Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PRODUCT TYPES

- A. Locker Type 2: Surface mounted on built-up base, 12-inch x 72-inch x 12-inch deep, 2-tier lockers.

### 2.2 MANUFACTURERS

- A. Source Limitations: Obtain lockers and accessories from single source from single locker manufacturer.
- B. Obtain locks from single lock manufacturer.

### 2.3 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: For lockers indicated to be accessible, comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.
- B. Surface Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame Spread Index: 25 or less.
  - 2. Smoke Developed Index: 450 or less.
- C. Scratch Resistance: Locker materials shall be scratch resistant when the maximum Load Value exceeds 10 kilograms when tested in accordance with ASTM D 2197.
- D. Impact Resistance: Locker materials shall withstand an Impact Force Value in excess of 45 inch-lbs. when tested in accordance with ASTM D 2794.
- E. Screw Holding Strength: Locker materials shall withstand a direct pull force that exceeds 2,500 lbs. per fastener when tested in accordance with ASTM D 1037, Direct Screw Withdrawal Test.
- F. Tensile Strength: Locker materials shall have a Modulus of Elasticity of 1.55 million psi.
- G. Shear Strength: Locker materials shall have a shear strength of 2,000 psi minimum.
- H. Compression Strength: Locker materials shall have a compression strength of 24,000 psi minimum.
- I. Water Absorption: Locker materials shall have a water absorption rate of less than 0.37 percent when tested in accordance with ASTM D 570.

## 2.4 PHENOLIC LOCKERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Columbia Lockers, a Division of Partition Systems Incorporated of South Carolina; Columbia Phenolic Lockers or equivalent lockers by one of the following:
  - 1. ASI Storage Solutions
  - 2. Club Resource Group
  - 3. Spec-Rite Designs, LLC
  - 4. Summit Lockers
- B. Construction: Factory fully-assembled locker units.
- C. Panel Material: Solid phenolic-core panel material with decorative melamine facing on both sides fused to substrate during panel manufacture. Separately laminated surfaces not acceptable.
- D. Fire Rating: Core or panel material shall meet Class A fire resistance per ASTM E84.
- E. Material Finished Thickness:
  - 1. Doors and End Panels: Minimum 0.50-inch (13 mm).
  - 2. Tops, Bottoms, and Shelves: Minimum 0.375-inch (10 mm).
  - 3. Sides and Backs: Minimum 0.3125-inch (8 mm).
- F. Exposed Edges: Straight profile with eased edges to remove sharpness and machine polished free from tooling imperfections.
- G. Colors:
  - 1. Locker Exterior Surfaces: As selected by A/E from manufacturer's full range of colors, patterns and wood grains.
  - 2. Locker Interior Surfaces: White.
  - 3. Panel Edges: Black.
- H. Locker Doors: Frameless, full width of locker box with perimeter ventilation; fasten hinge to door with stainless steel theft proof pinned Torx head fasteners
- I. Locker Body: Mortise and tenon construction and mechanically fastened together with stainless steel fasteners. Shelves shall be mortised into side walls of the locker body. Hinge shall be attached to the locker body with stainless steel theft proof pinned Torx head bolts.

## 2.5 HARDWARE

- A. Hinges: Minimum 14-gauge Type 304 stainless steel, 90-degree five-knuckle hinge. Provide two hinges on doors 36 inches high or less and three hinges on doors greater than 36 inches high. Finish: Satin.
- B. Locker Hasp Bar: Minimum 11-gauge Type 304 stainless steel with edges polished and smooth. Attach hasp to the locker body with two stainless steel theft proof pinned Torx head fasteners or through-bolts. Hasp shall extend through a slot in the face of the locker door and locker number plate for padlock. Finish: Satin.
- C. Coat Hooks: Minimum 11-gauge Type 304 stainless steel with edges polished and smooth. Attach coat hooks the locker body with stainless steel theft proof pinned Torx head fasteners or through-bolts. Provide three per locker. Finish: Satin.
- D. Door Identification Plates: Engraved numbers shall be a minimum 1/2-inch high and up to four alphanumeric characters. Obtain Owner approval for numbering sequence.

## 2.6 LOCKER ACCESSORIES

- A. Locker Legs: Manufacturer's standard structural and adjustable leg assembly with toe kick plate and mounting hardware.
- B. Coat Rod: Stainless steel rod installed in locker opening.

## 2.7 FABRICATION

- A. Fabricate lockers square, rigid, and without warp, with finish faces flat and free of scratches and chips.
- B. Machine attachment holes accurately and free of chips.
- C. Fully conceal assembly fasteners.
- D. Fabricate corners and fillers as required for installation.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine walls and floors with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

- A. Install lockers at locations indicated in accordance with manufacturer's instructions for plumb, level, rigid, and flush installation.
- B. Space fastenings approximately 48 inches o.c., unless otherwise recommended by manufacturer using concealed fasteners.
- C. Install trim, filler panels, corner fillers, and end panels, using concealed fasteners. Provide flush, hairline joints against adjacent surfaces.

## 3.3 ADJUSTING AND CLEANING

- A. Adjust doors and hardware to operate easily without binding.
- B. Field touch-up of scratches or defaced finish is not acceptable. Replace any damaged, scratched, marred or otherwise defective materials.

End of Section 10 51 29



## **DIVISION 11**



## **SECTION 11 98 00 - DETENTION EQUIPMENT**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes:
  - 1. Tilt-out pistol lockers.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for general requirements for detention work.
  - 2. Section 05 05 53: Security Metal Fastenings
  - 3. Section 08 71 63: Detention Door Hardware; for cylinders and keying for detention equipment
  - 4. Section 12 55 00: Detention Furniture

#### **1.3 COORDINATION**

- A. Coordinate installation of anchorages for detention equipment. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.
- B. Coordinate size and location of recesses in wall construction to receive recessed detention equipment.

#### **1.4 SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for detention equipment.
- B. Shop Drawings: For detention equipment.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Indicate locations, dimensions, and profiles of wall reinforcements.
  - 3. Indicate locations and installation details of built-in anchors.
  - 4. Show elevations and indicate dimensions of detention equipment, preparations for receiving anchors, and locations of anchorage.
  - 5. Show details of attachment of detention equipment to built-in anchors.
- C. Samples for Initial Selection: For detention equipment with factory applied color finishes.
- D. Welding certificates.
- E. Examination reports documenting inspections of substrates, areas, and conditions.
- F. Anchor inspection reports documenting inspections of built-in anchors.
- G. Field quality control reports documenting inspections of installed products.
  - 1. Field quality control certification signed by Contractor and DEC.

## 1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
  - 3. AWS D1.6, "Structural Welding Code - Stainless Steel."

## 1.6 FIELD CONDITIONS

- A. Field Measurements: Verify openings for recessed detention equipment by field measurements before fabrication.

## PART 2 - PRODUCTS

### 2.1 TILT-OUT PISTOL LOCKERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide PSI LLC; PL-408 Tilt-Out Pistol Locker or an equivalent product by, but not limited to, one of the following:
  - 1. BarkerBuilt, Division of Bob Barker Company, Inc.
  - 2. Norix Group, Inc.
  - 3. Southern Folger Detention Equipment Company
  - 4. Sweeper Metal Fabricators Corp.
  - 5. Willow Products Company, Inc.
- B. Cabinet: Minimum 35 inches wide by 29-1/2 inches high by 6 inches deep; formed from 0.134-inch nominal thickness steel sheet.
  - 1. Compartments: Six.
- C. Tilt-Out Compartments: Doors formed from 0.134-inch nominal thickness steel sheet, supported by heavy-duty continuous bottom hinge, with attached tilt-out compartment with formed metal sides. Line each compartment with mothproofed felt or nonabsorbing, closed-cell padding.
  - 1. Door Size: 15-1/4 inches wide by 8-7/16 inches high.
- D. Locks: Snap type, keyed differently and master keyed; provide one lock for each compartment. Provide 2 keys per compartment.
- E. Mounting: Recessed, with 2 inch by 2 inch by 3/16 inch steel angle frame welded to body.
- F. Materials:
  - 1. Steel Plates, Shapes, and Bars: ASTM A 36.
  - 2. Cold-Rolled Steel Sheet: ASTM A 1008, CS (Commercial Steel), Type B; suitable for exposed applications.
  - 3. Hot-Rolled Steel Sheet: ASTM A 1011, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- G. Finishes:
  - 1. Steel Factory Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil for topcoat.
  - 2. Color and Gloss: As selected by Architect from manufacturer's full range.

## 2.2 FABRICATION

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Coordinate dimensions and attachment methods of detention equipment with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Form and grind edges and corners to be free of sharp edges or rough areas.
- E. Form metal in maximum lengths to minimize joints. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- F. Weld corners and seams continuously to comply with referenced AWS standard and the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
  - 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure detention equipment rigidly in place and to support expected loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed metal units as needed to attach and support other construction.
- H. Cut, reinforce, drill, and tap detention equipment as indicated to receive hardware, fasteners, and similar items.
- I. Form exposed work true to line and level with accurate angles, surfaces, and straight sharp edges.
- J. Form exposed connections with hairline joints, flush and smooth using concealed fasteners where possible.
- K. Locate joints where least conspicuous.

## 2.3 ACCESSORIES

- A. Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.
- B. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16-inch thick; with minimum 1/2-inch diameter, headed studs welded to back of plate.
- C. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention equipment.
  - 1. Examine roughing-in for embedded plates to verify actual locations of detention equipment before detention equipment installation.
  - 2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention equipment.
- B. Verify locations of detention equipment with those indicated on Shop Drawings.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing detention equipment to in-place construction. Include threaded fasteners for concrete and masonry inserts, security fasteners, and other connectors.
- B. Cutting, Fitting, and Placement: Obtain manufacturer's written approval for cutting, drilling, and fitting required for installing detention equipment. Set detention equipment accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete or masonry or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
- E. Adjust doors and latches of detention equipment to operate easily without binding. Verify that integral locking devices operate properly.
- F. Assemble detention equipment requiring field assembly with security fasteners with no exposed fasteners on exposed faces and frames.
- G. Security Fasteners: Install detention equipment using security fasteners with head style appropriate for installation requirements, strength, and finish of adjacent materials. Provide stainless steel security fasteners in stainless steel materials.

### **3.3 FIELD QUALITY CONTROL**

- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
- B. Remove and replace detention work if inspections indicate that work does not comply with specified requirements. Remove malfunctioning units; replace with new units.
- C. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- D. Prepare field quality control certification endorsed by DEC that states installed products and their installation comply with requirements in the Contract Documents.

3.4 CLEANING AND PROTECTION

- A. Touchup Painting: Immediately after erection, clean bolted connections and abraded areas of shop paint, and paint exposed areas with same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

End of Section **11 98 00**

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## **SECTION 11 98 19 - DETENTION ROOM PADDING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes room padding system for floors, walls, doors and frames in Safety Cell.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for general requirements for detention work.
  - 2. Section 04 20 00 "Unit Masonry."
  - 3. Section 08 34 63 "Detention Doors and Frames."
  - 4. Division 22: Plumbing; Detox Toilet.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data and installation instructions.
- B. Shop Drawings: For each type of room padding system and accessory. Include plans, elevations, sections, assembly, thickness of materials, attachment details, and sealing and glazing details. Drawings shall clearly differentiate mounting locations, padding sizes, mounting heights, and rough openings for each padding surface area.
- C. Samples: For each exposed color and texture selected by Architect from manufacturer's full range of colors and textures, approximately 12 inches square and of same thickness indicated. Include attachment components.
- D. Product Test Reports: For each type of room padding system, for tests performed by a qualified testing agency.
- E. Maintenance Data: Submit manufacturer's printed instructions for proper care and maintenance of each type of room padding system, including precautions for use of cleaning materials that could be detrimental to finishes and performance or that could damage padding material.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Installer shall be trained or qualified by manufacturer in installation techniques and procedures of room padding system with a minimum of 5 years' experience in the successful fabrication and installation of detention room padding system.

#### **1.5 FIELD CONDITIONS**

- A. Environmental Limitations: Do not install room padding system until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### **1.6 WARRANTY**

- A. Manufacturer agrees to repair or replace materials and components of room padding system that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
  - 2. Structural failures including, but not limited to, excessive deflection.

3. Deterioration of materials and finishes including, but not limited to, loss of adhesion, resiliency, delamination, and fungus permeation.
- B. Warranty Period: Three years from date of Substantial Completion.
- C. Warranty does not cover damage caused by non-organic human body parts or damage caused by sharp or burning objects.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Fire-Test-Response Characteristics: As determined by testing identical room padding system applied to identical substrates according to test method indicated below by a qualified testing agency.
1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency.
    - a. Flame-Spread Index: 5 or less.
    - b. Smoke-Developed Index: 20 or less.

### **2.2 ROOM PADDING SYSTEM**

- A. General: Provide field applied padding system consisting of prefabricated protective padding material.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Marathon Engineering Corp.; Gold Medal Safety Padding or an equivalent system by one of the following:
1. B&E Padded Surfaces, Indianapolis, IN
  2. Prime Coat Coating Systems, Gurnee, IL

### **2.3 MATERIALS**

- A. Padding: Synthetic resinous material, in thickness recommended by manufacturer, meeting the following requirements:
1. Weight: Approximately 5 lbs. /sq. ft.
  2. Tensile Strength Range: Minimum 300 psi, ASTM D 412.
  3. Temperature Stability: Unaffected from 20 degrees F. to 120 degrees F.
  4. Moisture Absorption: 0.8 to 1.05 percent by weight.
  5. Compression Set: 90 percent recovery after 72 hours.
  6. Compression Properties: 30 to 70 psi at 50 percent modulus.
  7. Elongation at Break: 150 percent typical, ASTM D 412.
  8. Acute Oral Toxicity Test: Non Toxic.
  9. Hardness: 60 (plus or minus 5) durometer.
  10. Fungus Resistance: MIL-I-531-D, Completely Resistant Rating.
- B. Closed cell polyvinyl chloride or other types of polyvinyl chloride surfacing padding material not be permitted.
- C. Backing Board: Oriented strand board, DOC PS 2, Exposure 1, 7/16-inch thick, fire-retardant treated.
- D. Filler Material: Manufacturer's standard filler compound.
- E. Topcoat: Manufacturer's standard topcoat.
- F. Fasteners: As recommended by manufacturer.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and conditions, with DEC present, for compliance with requirements for proper installation of padding system, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Verify that ambient temperatures will be within range required by manufacturer for successful installation and curing of padding system.
- B. Verify that work of other trades are complete and will not adversely affect curing and protection of detention room padding system.

#### **3.3 INSTALLATION**

- A. Install padding system plumb, level, and true in accordance with manufacturer's instructions and approved shop drawings.
- B. Provide seamless padding system to prevent pass-thru and storage of contraband.
- C. Coordinate with requirements of the respective trades for correct mounting at penetrations of padding system.
- D. Floor Panels: Prefabricated panels consisting of 3/4 inch padding material bonded to backing board, nominal 1-1/4 inches thick.
- E. Wall and Door Panels: Prefabricated panels consisting of 1 inch padding material bonded to backing board, nominal 1-1/2 inches thick.
- F. Door Frames: 1/2 inch padding material bonded to backing board, nominal 1 inch thick.
- G. Vertical panels shall be mechanically fastened to substrates. Provide number of fasteners per panel as recommended by manufacturer for each type of substrate.
- H. Provide a gap of 1/8 inch, plus or minus 1/16 inch, between panels. Completely fill joints with filler material. When filler material is fully cured, sand material to produce smooth adjacent edges.
- I. Completely fill fastener holes with filler material. When filler material is fully cured, sand material to produce smooth adjacent edges.
- J. After completion of sanding padding surfaces, apply topcoat to all exposed surfaces.

#### **3.4 CLEANING AND PROTECTION**

- A. After completion of padding installation, clean exposed surfaces according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer, to ensure that padding is without damage or deterioration at time of Substantial Completion.
- C. Replace padding that cannot be cleaned and repaired, in a manner approved by Owner, at no additional cost to the Owner.

**End of Section 11 98 19**

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## **DIVISION 12**



## **SECTION 12 36 16.13 - DETENTION METAL COUNTERTOPS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Stainless-steel detention countertops.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for Detention Equipment Contractor requirements.
  - 2. Section 12 55 00 "Detention Furniture• " for detention tables and chairs.

#### **1.3 COORDINATION**

- A. Coordinate sizes and locations of steel embed blocks, framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded wall-mounted countertops.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Shop Drawings: For metal fabrications.
  - 1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
  - 2. For countertops, show locations and sizes of cutouts and holes for items installed in metal countertops.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products only after casework and supports on which they will be installed has been completed in installation areas.
- B. Keep finished surfaces of products covered with polyethylene film or other protective covering during handling and installation.

#### **1.6 FIELD CONDITIONS**

- A. Field Measurements: Where products are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- B. Established Dimensions: Where products are indicated to fit to other construction, establish dimensions for areas where products are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

## **PART 2 - PRODUCTS**

### **2.1 STAINLESS-STEEL FABRICATIONS**

- A. Detention Countertops: Fabricate from 0.109-inch-thick, stainless-steel sheet. Provide smooth, clean exposed tops and edges in uniform plane, free of defects. Provide front and end overhang of 1 inch over the base cabinets.
  - 1. Joints: Fabricate countertops without field-made joints.
  - 2. Weld shop-made joints.
  - 3. Extend the top down to provide a 1-inch- thick edge with a 1/2-inch return flange.
  - 4. Hem all edges to provide edges free of sharp edges and gaps.
- B. Detention Countertops Supports: Fabricate from 3/16-inch steel sheet welded at connections to countertops.
  - 1. Provide 3/16-inch thick steel angles for support at side walls.

### **2.2 MATERIALS**

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
- C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- D. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
- E. Steel Tubing: ASTM A 513/A 513M, Type B unless otherwise indicated; thickness indicated or required by structural loads.
- F. Sealant for Countertops: Type 6 Security Sealant. Coordinate with Section 07 92 16.13 Contractor.

### **2.3 STAINLESS-STEEL FINISH**

- A. Grind and polish surfaces to produce uniform, directional satin finish matching No. 4 finish, with no evidence of welds and free of cross scratches. Run grain with long dimension of each piece. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces clean.

## **PART 3 - EXECUTION**

### **3.1 COORDINATION**

- A. Coordinate locations of steel embed blocks with Section 04 20 00 Contractor.

### **3.2 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.3 INSTALLATION**

- A. Install detention countertops level, plumb, and true.



- B. Field Jointing: Where possible, make field jointing in the same manner as shop jointing; use fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
- C. Secure countertops to walls by welding in place.
- D. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection.
- E. Coordinate sealing of junctures of countertops and walls with Type 6 sealant.

#### 3.4 CLEANING AND PROTECTION

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces. Remove and replace damaged products or touch up and refinish damaged areas to match original factory finish, as approved by Architect.
- C. Protection: Provide 6-mil plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION

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## **SECTION 12 55 00 - DETENTION FURNITURE**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Detention bunks.
  - 2. Detention tables with stools.
  - 3. Detention stools.
  - 4. Detention benches.
- B. Related Requirements:
  - 1. Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for Detention Equipment Contractor requirements.
  - 2. Section 08 71 63 "Detention Door Hardware" for security key cabinets.
  - 3. Section 10 28 13.63 "Detention Toilet Accessories" for detention toilet and bath accessories.
  - 4. Section 11 98 00 "Detention Equipment" for miscellaneous detention items.

#### **1.3 COORDINATION**

- A. Detention Equipment Contractor: Coordinate with Section 01 35 13.16 "Special Project Procedures for Detention Facilities" for requirements of this Section that are to be performed by a Detention Equipment Contractor or other entity.
- B. Coordinate installation of anchorages for detention furniture. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.
- C. Coordinate size and location of recesses in wall construction to receive detention furniture.

#### **1.4 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.5 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for detention furniture.
- B. Shop Drawings: For detention furniture.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Indicate locations, dimensions, and profiles of wall and floor reinforcements.
  - 3. Indicate locations and installation details of built-in anchors.
  - 4. Show elevations of detention furniture and indicate dimensions of furniture, preparations for receiving anchors, and locations of anchorage.
  - 5. Show details of attachment of detention furniture to built-in anchors.
- C. Samples for Initial Selection: For detention furniture with factory-applied color finishes.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Examination reports, documenting inspections of substrates, areas, and conditions.
- B. Anchor inspection reports, documenting inspections of built-in and cast-in anchors.
- C. Field quality-control reports, documenting inspections of installed products.
  - 1. Field quality-control certification, signed by Contractor and Detention Equipment Contractor.

## 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For detention mattresses to include in maintenance manuals.

## 1.8 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
  - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

## 1.9 FIELD CONDITIONS

- A. Field Measurements: Verify openings for recessed detention furniture by field measurements before fabrication.

# PART 2 - PRODUCTS

## 2.1 DETENTION BUNKS

- A. Freestanding Double Bunks:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. American Jail Products L.L.C.
    - b. BarkerBuilt, Division of Bob Barker Company, Inc.
    - c. Norix Group, Inc.
    - d. PSI LLC.
    - e. Sweeper Metal Fabricators Corp.
    - f. Willo Products Company, Inc.
  - 2. Bunk Pan: Formed from 0.134-inch nominal-thickness steel sheet, each pan perforated with at least six holes.
    - a. Size: Minimum 27 inches wide by 76 inches long with lower bunk pan 14 inches above floor and upper bunk pan at least 51 inches above floor.
    - b. Upper Bunk Edges: Turn up edges of back and sides and turn down edge of front, with minimum 2-inch flanges.
    - c. Lower Bunk Edges: Turn up edges of back and sides and turn down edge of front, with minimum 2-inch flanges.
  - 3. Legs and Frames: Formed from 2-by-2-by-3/16-inch steel angle welded at connections to each other and to bunk pan; provide four legs for each bunk.
  - 4. Mounting Plates: Formed from 1/4-inch- thick, steel plate punched with one hole for floor anchorage; provide one mounting plate for each leg.
  - 5. Assembly: Knocked down for field assembly.
- B. Materials:
  - 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
3. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Finishes:

1. Steel Baked-Enamel or Powder-Coat Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
  - a. Color and Gloss: As selected by Architect from manufacturer's full range.

## 2.2 DETENTION TABLES

A. Pedestal-Style Table:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Jail Products L.L.C.
  - b. BarkerBuilt, Division of Bob Barker Company, Inc.
  - c. PSI LLC.
  - d. Sweeper Metal Fabricators Corp.
  - e. Viking Products
  - f. Willo Products Company, Inc.
2. Tabletop: Formed from 0.109-inch- thick, stainless-steel sheet; reinforced with steel shapes or steel plate, with minimum 1-1/2-inch flanged edges. Opposite side anchored to wall.
  - a. Size (2 Person): Minimum 36 inches square with diagonal corners by 30 inches high.
3. Seats: 12-inch diameter, formed from 0.078-inch- thick, stainless-steel sheet; reinforced with 0.134-inch nominal-thickness steel plate, with minimum 1-1/2-inch flanged edges.
4. Pedestal Supports: Formed from 4-inch-square by 0.134-inch- thick, steel tubing welded to top and base plate.
5. Seat Framing: Formed from 3-by-2-by-3/16-inch- thick, steel tubing welded to pedestal supports.
6. Base Plate: Minimum 16-inch- square, 1/4-inch- thick, steel plate punched with four holes for floor anchorage.
7. Capacity: As indicated on Drawings.

B. Materials:

1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
3. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
4. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
5. Steel Tubing: ASTM A 513/A 513M, Type B unless otherwise indicated; thickness indicated or required by structural loads.

C. Finishes:

1. Steel Baked-Enamel or Powder-Coat Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
  - a. Color and Gloss: As selected by Architect from manufacturer's full range.
2. Stainless-Steel Finish:

- a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- b. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
  - 1) Run grain of directional finishes with long dimension of each piece.
  - 2) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
  - 3) Directional Satin Finish: No 4.

## 2.3 DETENTION STOOLS

### A. Floor-Mounted Stool:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Jail Products L.L.C.
  - b. BarkerBuilt, Division of Bob Barker Company, Inc.
  - c. PSI LLC.
  - d. Viking Products
  - e. Willo Products Company, Inc.
2. Seats: Minimum 12-inch diameter, formed from 0.075-inch nominal-thickness steel sheet; reinforced with 0.134-inch- thick steel sheet cut to interior dimension of seat, with minimum 1-1/2-inch flanged edges.
3. Seat Support: Formed from steel pipe or 2-inch-OD-by-0.075-inch- thick, steel tubing welded to seat reinforcement and base plate for an overall stool height of not less than 18 inches.
4. Base Plate: Minimum 8-by-1/4-inch- thick, square punched with four holes for floor anchorage.

### B. Wall-Mounted Stool:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Jail Products L.L.C.
  - b. PSI LLC.
  - c. Viking Products
  - d. Willo Products Company, Inc.
2. Seat: Minimum 12-inch diameter, formed from 0.075-inch nominal-thickness steel sheet; reinforced with 0.134-inch- thick steel sheet cut to interior dimension of seat, with minimum 1-1/2-inch flanged edges.
3. Seat Support: Formed from 1-by-2-by-0.075-inch- thick, steel tubing; 2-inch-OD-by-0.075-inch- thick, steel tubing; or 3/8-inch- thick, steel plate bar; welded to seat reinforcement and wall bracket.
4. Swivel Wall Bracket: Minimum 1/2-inch pivot pin, with 3/8-inch- thick, steel plate for welding to embedded steel plate.

### C. Materials:

1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
3. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
4. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
5. Steel Tubing: ASTM A 513/A 513M, Type B unless otherwise indicated; thickness indicated or required by structural loads.

D. Finishes:

1. Steel Baked-Enamel or Powder-Coat Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
  - a. Color and Gloss: As selected by Architect from manufacturer's full range.
2. Stainless-Steel Finish:
  - a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
  - b. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
    - 1) Run grain of directional finishes with long dimension of each piece.
    - 2) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
    - 3) Directional Satin Finish: No 4.

2.4 DETENTION BENCHES

A. Floor-Mounted Bench:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. American Jail Products L.L.C.
  - b. G2 Automated Technologies, LLC/Kryptomax
  - c. PSI LLC.
  - d. Viking Products
  - e. Willo Products Company, Inc.
2. Bench Top: Formed from 2 gage sheet, with minimum 1-1/2-inch (38-mm) flanged edges.
  - a. Size: As indicated on Drawings.
3. Supports: Formed from 0.164-inch- (4.18-mm-) thick, formed-steel channels or 2-1/2-inch-OD-by-0.0677-inch- (64-mm-OD-by-1.7-mm-) thick, steel tubing; welded to bench and base plate for an overall bench height of not less than 18 inches (457 mm). Provide three supports for benches with length of more than 72 inches.
4. Handcuff Ring: Formed from 3/8-inch- (9.5-mm-) diameter, stainless steel rod; welded to front of each support.
5. Base Plates: Minimum 8-inch-square by 1/4-inch- thick, steel plate punched with four holes for floor anchorage.

B. Materials:

1. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
3. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
4. Stainless Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666 or ASTM A240/A240M, austenitic stainless steel, Type 304.
5. Steel Tubing: ASTM A513/A513M, Type B unless otherwise indicated; thickness indicated or required by structural loads.
6. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless another weight is indicated or required by structural loads.

C. Finishes:

1. Stainless Steel Finish:

- a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- b. Polished Finish: Grind and polish surfaces to produce uniform finish, free of cross scratches.
  - 1) Run grain of directional finishes with long dimension of each piece.
  - 2) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
  - 3) Directional Satin Finish: No 4.

## 2.5 FABRICATION

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Coordinate dimensions and attachment methods of detention furniture with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Form and grind edges and corners to be free of sharp edges or rough areas.
  - 1. Fabricate detention furniture with no more than 1/32-inch gap between component materials. Weld edges that cannot be crimped to meet tolerance so as to provide a seamless joint with no place for concealment of contraband.
- E. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- F. Weld corners and seams continuously to comply with referenced AWS standard and the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
  - 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure detention furniture rigidly in place and to support expected loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.
- H. Cut, reinforce, drill, and tap detention furniture as indicated to receive hardware, security fasteners, and similar items.
- I. Form exposed work true to line and level with accurate angles, surfaces, and straight sharp edges.
- J. Form exposed connections with hairline joints, flush and smooth using concealed fasteners where possible. Use exposed security fasteners of type indicated or, if not indicated, flat-head (countersunk) security fasteners. Locate joints where least conspicuous.



## 2.6 SECURITY FASTENERS

- A. Security Fasteners: See Section 05 05 53 "Security Metal Fastenings"

## 2.7 SECURITY SEALANTS

- A. Security Sealants: See Section 07 92 16.13 "Security Joint Sealants."

## 2.8 ACCESSORIES

- A. Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.
- B. Cast-in-Place Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing per ASTM E 488/E 488M, conducted by a qualified testing agency; of type indicated below:
  - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed; hot-dip galvanized per ASTM A 153/A 153M or ASTM F 2329/F 2329M.
- C. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch thick; with minimum 1/2-inch- diameter, headed studs welded to back of plate.
- D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention furniture.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention furniture before detention furniture installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention furniture.
- D. Inspect built-in and cast-in anchor installations, before installing detention furniture, to verify that anchor installations comply with requirements. Prepare inspection reports.
  - 1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
  - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- E. Verify locations of detention furniture with those indicated on Shop Drawings.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Cutting, Fitting, and Placement: Obtain manufacturer's written approval for cutting, drilling, and fitting required for installing detention furniture. Set detention furniture accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Provide temporary bracing or anchors in formwork for items that are to be built into masonry or similar construction.

- C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
  - D. Field Welding: Comply with the following requirements:
    - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    - 2. Obtain fusion without undercut or overlap.
    - 3. Remove welding flux immediately.
    - 4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
    - 5. Fillet Welds: Continuous.
  - E. Assemble detention furniture requiring field assembly with security fasteners with no exposed fasteners on exposed faces and frames.
  - F. Anchor furniture with security fasteners to floors and by welding to walls at intervals required by expected loads, but not more than 12 inches o.c.
  - G. Apply Type 6 security sealant at all exposed gaps between detention furniture and adjacent construction greater than 1/16 inch.
- 3.3 FIELD QUALITY CONTROL
- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
  - B. Remove and replace detention work if inspections indicate that work does not comply with specified requirements. Remove malfunctioning units; replace with new units.
  - C. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
  - D. Prepare field quality-control certification endorsed by Detention Equipment Contractor that states installed products and their installation comply with requirements in the Contract Documents.
- 3.4 CLEANING AND PROTECTION
- A. Touchup Painting: Immediately after erection, clean bolted connections and abraded areas of shop paint, and paint exposed areas with same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION

## **SECTION 12 67 23 - BENCHES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Courtroom bench seating.

#### **1.2 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at Project site.

#### **1.3 ACTION SUBMITTALS**

- A. Shop Drawings:
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Seating Layout: Show seating layout, aisle widths, aisle-end alignment or stepping, and row spacing.
- B. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
  - 1. Wood Materials and Finishes: Manufacturer's standard-size unit, not less than 3 inches square.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Sample Warranty: For special warranty.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For fixed audience seating to include in operation and maintenance manuals.
  - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
    - a. Precautions for cleaning materials and methods that could be detrimental to seating finishes and performance.

#### **1.6 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace components of bench seating that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including standards, beams, and pedestals.
  - 2. Warranty Periods: As follows, from date of Substantial Completion.
    - a. Wood, and Finish Components: Two years.

### **PART 2 - PRODUCTS**

#### **2.1 SOURCE LIMITATIONS**

- A. Obtain each type of seating required, including accessories and mounting components, from single source from single manufacturer.

## 2.2 BENCH SEATING

- A. Bench Seating: Assembly-space seating in permanent arrangement as indicated on Drawings.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Dumas Pews
    - b. Hale Manufacturing
    - c. Kivett's Fine Church Furniture
    - d. Rattigan-Schottler
    - e. Sauder Manufacturing Co.
- B. Products: Match existing oak courtroom bench seating, and as indicated on drawings.
- C. Bench Mounting Standards: Floor attached.

## 2.3 MATERIALS AND FINISHES

- A. Hardwood Lumber and Veneer Faces: Match existing red oak, selected to be free of visible defects.
  - 1. Stain and Finish: Match existing.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine floors, and other adjacent work and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install benches in locations indicated and fasten to substrates in accordance with manufacturer's written installation instructions.
  - 1. Install standards plumb.

### 3.3 ADJUSTING

- A. Repair minor abrasions and imperfections in finishes with coating that matches factory-applied finish.
- B. Replace damaged and malfunctioning components that cannot be acceptably repaired.

END OF SECTION

## **DIVISION 14**



## **SECTION 14 42 00 - WHEELCHAIR LIFTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Vertical platform lifts.

#### **1.3 DEFINITIONS**

- A. Definitions in ASME A18.1 apply to Work of this Section.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components, and finishes for lifts.
  - 2. Include rated capacities, operating characteristics, electrical characteristics, safety features, controls, finishes, and accessories.
- B. Shop Drawings: For each lift.
  - 1. Include plans, elevations, sections, attachment details, and required clearances.
  - 2. Indicate dimensions, weights, loads, and points of load to building structure.
  - 3. Include details of equipment assemblies, method of field assembly, components, and location and size of each field connection.
  - 4. Include diagrams for power, signal, and control wiring.
- C. Samples for Initial Selection: For surfaces and components with factory-applied color finishes.
  - 1. Include Samples of integrally colored materials and accessories involving color selection.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For manufacturer Installer.
- B. Product Certificates: For each type of lift.
  - 1. Include statement that runway, ramp or pit, dimensions as shown on Drawings, and electrical service as shown and specified are adequate for lift being provided.
- C. Sample Warranty: For special warranty.

#### **1.6 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: For each type of lift to include in operation and maintenance manuals.
  - 1. In addition to items specified in Section 01 78 23 "Operation and Maintenance Data," include the following:
    - a. Parts list with sources indicated.
    - b. Recommended parts inventory list.
- B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted use of lifts.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
  - 1. Maintenance Proximity: Not more than fourhours' normal travel time from Installer's place of business to Project site.

## 1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of lifts that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.
- B. Regulatory Requirements: Comply with ASME A18.1, "Safety Standard for Platform Lifts and Stairway Chairlifts."

### 2.2 VERTICAL PLATFORM LIFT

- A. Vertical Platform Lift, General: Preengineered lift system.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Garaventa Lift; Genesis Opal Vertical Platform Wheelchair Lift or comparable product by one of the following:
    - a. Ascension, Division of AGM Container Controls, Inc.
    - b. Liftavator, Inc.
    - c. Savaria.
- B. Number of Stops: Two.
- C. Platform Size:
  - 1. Lift 1234: 36 by 54 7/8 inches.
  - 2. Lift 2234: 42 by 60 inches.
- D. Door Operation and Clear Opening Width: Low-energy, power-operated doors that remain open for 20 seconds minimum.
  - 1. Lift 1234: End doors with minimum 36-inch clear opening width.
  - 2. Lift 2234: End door with minimum 36-inch, and side door with minimum 42-inch clear opening width.
- E. Rated Speed: 10 fpm.
- F. Power Supply: Electric.
  - 1. Electrical Characteristics:
    - a. Horsepower: 2.
    - b. Voltage: 208-V ac, three phase, 60 Hz.
- G. Emergency Operation: Provide battery power system to raise or lower unit to a landing in case of malfunction or power loss.
- H. Self-Supporting Unit: Support vertical loads of unit only at base, with lateral support only at landing levels.



- I. Platform: Steel sheet or galvanized-steel sheet with manufacturer's standard black rubber flooring.
- J. Platform Enclosure and Door: Rectangular steel-tube frame with flush steel-sheet panels.
- K. Platform Top: Provide a non-load-bearing top, matching construction of enclosure walls. Permanently mark top to indicate that it cannot sustain a load.
- L. Ramp: Fixed ramp matching platform to provide transition from floor to lift platform at bottom landing.
  - 1. Ramp Slope: Maximum 1:12.
  - 2. Ramp Finish: Finish ramps to match lift platform.

### 2.3 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500/A 500M.
- C. Steel Pipe: ASTM A 53/A 53M; standard weight (Schedule 40) unless otherwise indicated or required by loads.
- D. Steel Sheet: ASTM A 1008/A 1008M, cold-rolled commercial steel (CS) or ASTM A 1011/A 1011M hot-rolled, commercial steel (CS); as required for each use.
- E. Fiberglass: Multiple laminations of glass-fiber-reinforced polyester resin with UV-light-stable, colorfast, nonfading, weather- and stain-resistant, colored polyester gel coat, and manufacturer's standard finish.
- F. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing structural members, guide rails, machines, and other lift components where installation of devices is specified in another Section.
- G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

### 2.4 FASTENERS

- A. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.
  - 1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
- B. Power-Actuated Fasteners: Do not use power-actuated fasteners.

### 2.5 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

### 2.6 FINISHES

- A. Factory Finish:

1. Baked-Enamel or Powder-Coat Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat with a minimum dry film thickness of 1 mil for topcoat.
2. Color and Gloss: As selected by Architect from manufacturer's full range.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, critical dimensions, and other conditions affecting performance of the Work.
- B. Minimum Headroom Clearance: Verify that installed lift will have a minimum headroom of 80 inches above any point on platform floor at any point of travel.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION**

- A. General: Comply with ASME A18.1 and manufacturer's written instructions for installation of lifts unless otherwise indicated.
- B. Secure lifts to building construction as follows unless otherwise indicated:
  1. For concrete anchorage, use post-installed anchors.
  2. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
- C. Wiring Method: Conceal conductors and cables within housings of units or building construction. Do not install conduit exposed to view in finished spaces. Bundle, lace, and route conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.
- D. Coordinate runway doors with platform travel and positioning, for accurate alignment and minimum clearance between platforms, runway doors, sills, and door frames.
- E. Position sills accurately and fill space under sills solidly with nonshrink, nonmetallic grout.
- F. Coordinate platform doors with platform travel and positioning.
- G. Adjust stops for accurate stopping at each landing, within required tolerances.
  1. Leveling Tolerance: 1/4 inch up or down, regardless of load and direction of travel.
- H. Lubricate operating parts of lift, including drive mechanism, guide rails, hinges, safety devices, and hardware.
- I. Test safety devices and verify smoothness of required protective enclosures and other surfaces.

#### **3.3 FIELD QUALITY CONTROL**

- A. Acceptance Testing: On completion of lift installation and before permitting use of lifts, perform acceptance tests as required and recommended by ASME A18.1 and authorities having jurisdiction.
- B. Operating Test: In addition to acceptance testing, load lifts to rated capacity and operate continuously for 30 minutes between lowest and highest landings served. Readjust stops, signal equipment, and other devices for accurate stopping and operation of system.

- C. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on lifts.

#### 3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lifts. Include a review of emergency systems and emergency procedures to be followed at time of operational failure and other building emergencies.
- B. Check operation of lifts with Owner's personnel present and before date of Substantial Completion. Determine that operating systems and devices are functioning properly.
- C. Check operation of lifts with Owner's personnel present not more than one month before end of warranty period. Determine that operating systems and devices are functioning properly.

END OF SECTION

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