

WRITTEN SPECIFICATION FOR:

RENOVATION AND ADDITION

NORTH MAIN ANNEX

Bulloch County Board of Commissioners

APRIL 27, 2022

**Bid Documents
Volume One of One**



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RENOVATIONS AND ADDITION- NORTH MAIN ANNEX

April 27, 2022
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Renovations and Additions North Main Annex Bid Documents 04/27/22

Volume One of One

| | | |
|---------------------|---|----|
| DIVISION 01- | GENERAL CONDITIONS | |
| 013300 | SUBMITTAL PROCEDURES | 8 |
| 015000 | TEMPORARY FACILITIES AND CONTROLS | 4 |
| 017300 | EXECUTION | 6 |
| | AIA133-2019 Sample Contract for Construction | 24 |
| DIVISION 02- | DEMOLITION | |
| 024119 | Selective Structure Demolition | 8 |
| DIVISION 03- | CONCRETE | |
| | <i>See Structural for Concrete and Light Weight Concrete Requirements</i> | |
| DIVISION 04- | MASONRY | |
| 040120 | Maintenance of Unit Masonry | 6 |
| 042000 | Unit Masonry- Brick and Brick Veneer | 6 |
| 042001 | Unit Masonry- CMU | 10 |
| 047200 | Unit Masonry- Cast Stone | 10 |
| DIVISION 05- | METALS | |
| 055213 | Pipe and Tube Railings | 8 |
| DIVISION 06- | WOODS AND PLASTICS | |
| 061000 | Rough Carpentry | 8 |
| 061600 | Sheathing | 6 |
| 062013 | Exterior Finish Carpentry (Wood Mouldings) | 6 |
| 064023 | Interior Architectural Woodwork | 16 |
| DIVISION 07- | THERMAL AND MOISTURE PROTECTION | |
| 072200 | Spray Applied Insulation | 4 |
| 073113 | Asphalt Shingles | 12 |
| 076200 | Sheet Metal Flashing and Trim | 8 |
| 078413 | Penetration Firestopping | 6 |
| 079000 | Joint Sealants | 10 |
| DIVISION 08- | OPENINGS | |
| 081113 | Hollow Metal Doors and Frames | 8 |
| 082120 | Stile and Rail Wood Doors | 4 |
| 083313 | Wood Overhead Coiling Doors | 4 |
| 084113 | Aluminum Framed Entrances and Storefront | 12 |
| 085200 | Aluminum Clad Wood Windows | 10 |
| 087100 | Door Hardware | 18 |

RENOVATIONS AND ADDITION- NORTH MAIN ANNEX

April 27, 2022
Bid Document

| | | |
|---------------------------------|--|----|
| 088000 | Glazing | 8 |
| DIVISION 09- FINISHES | | |
| 091110 | Non-Load Bearing Steel Framing | 6 |
| 092900 | Gypsum Board | 8 |
| 093100 | Porcelain Tile | 10 |
| | Porcelain Tile Cut Sheets | |
| 095100 | Suspended Acoustical Ceilings | 4 |
| | Suspended Tile Cut Sheets | |
| 096010 | Flooring Transitions | 2 |
| | Fusion Strip Cut Sheet | |
| 096519 | Resilient Tile Flooring- LVT | 4 |
| | LVT Cut Sheets | |
| 096800 | Carpet Tile | 2 |
| | Carpet Tile Cut Sheets | |
| | Infinity 2 Carpet Adhesive Cut Sheet | |
| 099100 | Paints and Coatings | 8 |
| | Floor Finish Key Plan | |
| DIVISION 10- SPECIALTIES | | |
| 104413 | Fire Extinguisher Cabinets | 6 |
| 104416 | Fire Extinguishers | 4 |
| DIVISION 11- EQUIPMENT | | |
| | NOT USED | |
| DIVISION 12- FURNISHINGS | | |
| 124960 | Motorized Roller Shades | 8 |
| | DECORATIVE LIGHT FIXTURE CUT SHEETS | |

NOTE: SEE CONSTRUCTION DRAWINGS FOR STRUCTURAL, MECHANICAL, ELECTRICAL AND PLUMBING SPECIFICATIONS.

END TABLE OF CONTENTS



SECTION 01 3300 - 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. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will be provided by Architect for Contractor's use in preparing submittals.
- 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. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

- D. Processing Time: Allow enough time for submittal review, including time for re-submittals, 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 re-submittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Re-submittal Review: Allow 15 days for review of each re-submittal.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
- E. Identification: Place a permanent label or title block on each submittal for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of supplier.
 - f. Name of manufacturer.
 - g. Number and title of appropriate Specification Section.
 - h. Drawing number and detail references, as appropriate.
 - i. Location(s) where product is to be installed, as appropriate.
- F. Deviations: Encircle or otherwise specifically identify deviations from the Contract Documents on submittals.
- G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
 2. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Use AIA Document G810.
 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- I. Re-submittals: Make re-submittals 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 "Accepted" or "Accepted with Comments".
- J. 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.
- K. Use for Construction: Use only final submittals with mark indicating "Accepted" or "Accepted with Comments" and signed by Architect or his representative.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Submit electronic submittals directly to extranet specifically established for Project.
- B. 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 printed data are not suitable 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 written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Standard product operation and maintenance manuals.

- g. Compliance with specified referenced standards.
 - h. Testing by recognized testing agency.
 - i. Application of testing agency labels and seals.
 4. Submit Product Data before or concurrent with Samples.
 5. Number of Copies: Submit three copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.
- C. 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 unless expressly approved by the Architect in writing.
 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Shopwork manufacturing instructions.
 - e. Templates and patterns.
 - f. Design calculations.
 - g. Compliance with specified standards.
 - h. Notation of dimensions established by field measurement.
 - i. Relationship to adjoining construction clearly indicated.
 - j. Seal and signature of professional engineer if specified.
 - k. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 3. Number of Copies: Submit three opaque copies of each submittal, unless copies are required for operation and maintenance manuals. Submit five copies where copies are required for operation and maintenance manuals. Architect will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.

- c. Sample source.
 - d. Number and title of appropriate Specification Section.
 3. 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 not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. 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 one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 - E. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
 - F. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
 - G. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
 - H. 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. Use CSI Form 1.5A. Include the following information in tabular form:
 1. Name, address, and telephone number 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.
 4. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
 - a. Mark up and retain one returned copy as a Project Record Document.
- 2.2 INFORMATIONAL SUBMITTALS
- A. General: Prepare and submit Informational Submittals required by other Specification Sections.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
 2. Certificates and Certifications: Provide a notarized 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.
 3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- D. Installer Certificates: Prepare 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.
- E. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- F. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- H. Material Test Reports: Prepare 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.
- I. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, 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.
- J. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- K. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.



- L. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.
 - 4. Required installation tolerances.
 - 5. Required adjustments.
 - 6. Recommendations for cleaning and protection.

- M. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.
 - 1. Architect will not review submittals that include MSDSs and will return the entire submittal for re-submittal.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. 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.

- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, 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.

3.2 ARCHITECT'S/ ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

- C. Partial submittals are not acceptable, will be considered non-responsive, and will be returned without review.

- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

END OF SECTION 01 3300



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

SECTION 01 5000 - 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. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections include the following:
 - 1. Division 01 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.

1.3 SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.4 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall 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. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."
- B. Paint: Comply with requirements in Division 09 painting Sections.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: 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 construction personnel. 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 not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack board.
 - 3. Drinking water and private toilet.
 - 4. Coffee machine and supplies.
 - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 - 6. 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.

PART 3 - EXECUTION

3.1 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 Division 01 Section "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.

3.2 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.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

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. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 01 5000



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

SECTION 01 7300 - 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. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Field engineering and surveying.
 - 2. General installation of products.
 - 3. Progress cleaning.
 - 4. Starting and adjusting.
 - 5. Protection of installed construction.
 - 6. Correction of the Work.
- B. Related Sections include the following:
 - 1. Division 01 Section "Submittal Procedures" for submitting surveys.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: 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 and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 5. 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. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 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 Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect 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.

3.4 INSTALLATION

- A. General: 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 8 feet in spaces without a suspended ceiling.
- 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 the best possible results. 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.

- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 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.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. 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 materials more than 7 days during normal weather or 3 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.
- B. Site: Maintain Project site free of waste materials and debris.
- C. 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.

- D. **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.
- E. **Concealed Spaces:** Remove debris from concealed spaces before enclosing the space.
- F. **Exposed Surfaces in Finished Areas:** Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. **Waste Disposal:** Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- H. **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.
- I. **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.
- J. **Limiting Exposures:** Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

- A. **Start equipment and operating components to confirm proper operation.** Remove malfunctioning units, replace with new units, and retest.
- B. **Adjust operating components for proper operation without binding.** Adjust equipment for proper operation.
- 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:** If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. **Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.**



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 7300

DRAFT AIA® Document A133™ - 2019

Standard Form of Agreement Between Owner and Construction Manager as Constructor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price

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

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

« »
« »
« »
« »

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

« »
« »
« »
« »

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

« »
« »
« »

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

« »
« »
« »
« »

The Owner and Construction Manager agree as follows.

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. Do not use with other general conditions unless this document is modified.



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TABLE OF ARTICLES

- 1 INITIAL INFORMATION
- 2 GENERAL PROVISIONS
- 3 CONSTRUCTION MANAGER'S RESPONSIBILITIES
- 4 OWNER'S RESPONSIBILITIES
- 5 COMPENSATION AND PAYMENTS FOR PRECONSTRUCTION PHASE SERVICES
- 6 COMPENSATION FOR CONSTRUCTION PHASE SERVICES
- 7 COST OF THE WORK FOR CONSTRUCTION PHASE
- 8 DISCOUNTS, REBATES, AND REFUNDS
- 9 SUBCONTRACTS AND OTHER AGREEMENTS
- 10 ACCOUNTING RECORDS
- 11 PAYMENTS FOR CONSTRUCTION PHASE SERVICES
- 12 DISPUTE RESOLUTION
- 13 TERMINATION OR SUSPENSION
- 14 MISCELLANEOUS PROVISIONS
- 15 SCOPE OF THE AGREEMENT

- EXHIBIT A GUARANTEED MAXIMUM PRICE AMENDMENT
- EXHIBIT B INSURANCE AND BONDS

ARTICLE 1 INITIAL INFORMATION

§ 1.1 This Agreement is based on the Initial Information set forth in this Section 1.1. (For each item in this section, insert the information or a statement such as "not applicable" or "unknown at time of execution.")

§ 1.1.1 The Owner's program for the Project, as described in Section 4.1.1: (Insert the Owner's program, identify documentation that establishes the Owner's program, or state the manner in which the program will be developed.)

<< >>

§ 1.1.2 The Project's physical characteristics: (Identify or describe pertinent information about the Project's physical characteristics, such as size; location; dimensions; geotechnical reports; site boundaries; topographic surveys; traffic and utility studies; availability of public and private utilities and services; legal description of the site, etc.)

<< >>

§ 1.1.3 The Owner's budget for the Guaranteed Maximum Price, as defined in Article 6: (Provide total and, if known, a line item breakdown.)

<< >>

§ 1.1.4 The Owner’s anticipated design and construction milestone dates:

- .1 Design phase milestone dates, if any:

« »

- .2 Construction commencement date:

« »

- .3 Substantial Completion date or dates:

« »

- .4 Other milestone dates:

« »

§ 1.1.5 The Owner’s requirements for accelerated or fast-track scheduling, or phased construction, are set forth below:
(Identify any requirements for fast-track scheduling or phased construction.)

« »

§ 1.1.6 The Owner’s anticipated Sustainable Objective for the Project:
(Identify and describe the Owner’s Sustainable Objective for the Project, if any.)

« »

§ 1.1.6.1 If the Owner identifies a Sustainable Objective, the Owner and Construction Manager shall complete and incorporate AIA Document E234™–2019, Sustainable Projects Exhibit, Construction Manager as Constructor Edition, into this Agreement to define the terms, conditions and services related to the Owner’s Sustainable Objective. If E234–2019 is incorporated into this agreement, the Owner and Construction Manager shall incorporate the completed E234–2019 into the agreements with the consultants and contractors performing services or Work in any way associated with the Sustainable Objective.

§ 1.1.7 Other Project information:
(Identify special characteristics or needs of the Project not provided elsewhere.)

« »

§ 1.1.8 The Owner identifies the following representative in accordance with Section 4.2:
(List name, address, and other contact information.)

« »

« »

« »

« »

« »

« »

§ 1.1.9 The persons or entities, in addition to the Owner’s representative, who are required to review the Construction Manager’s submittals to the Owner are as follows:
(List name, address and other contact information.)

« »

§ 1.1.10 The Owner shall retain the following consultants and contractors:
(List name, legal status, address, and other contact information.)

.1 Geotechnical Engineer:

« »« »
« »
« »
« »
« »

.2 Civil Engineer:

« »« »
« »
« »
« »
« »

.3 Other, if any:

« »

(List any other consultants retained by the Owner, such as a Project or Program Manager.)

§ 1.1.11 The Architect's representative:
(List name, address, and other contact information.)

« »
« »
« »
« »
« »
« »

§ 1.1.12 The Construction Manager identifies the following representative in accordance with Article 3:
(List name, address, and other contact information.)

« »
« »
« »
« »
« »
« »

§ 1.1.13 The Owner's requirements for the Construction Manager's staffing plan for Preconstruction Services, as required under Section 3.1.9:

(List any Owner-specific requirements to be included in the staffing plan.)

« »

§ 1.1.14 The Owner's requirements for subcontractor procurement for the performance of the Work:

(List any Owner-specific requirements for subcontractor procurement.)

« »

§ 1.1.15 Other Initial Information on which this Agreement is based:

§ 1.2 The Owner and Construction Manager may rely on the Initial Information. Both parties, however, recognize that such information may materially change and, in that event, the Owner and the Construction Manager shall appropriately adjust the Project schedule, the Construction Manager's services, and the Construction Manager's compensation. The Owner shall adjust the Owner's budget for the Guaranteed Maximum Price and the Owner's anticipated design and construction milestones, as necessary, to accommodate material changes in the Initial Information.

§ 1.3 Neither the Owner's nor the Construction Manager's representative shall be changed without ten days' prior notice to the other party.

ARTICLE 2 GENERAL PROVISIONS

§ 2.1 The Contract Documents

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract and are as fully a part of the Contract as if attached to this Agreement or repeated herein. Upon the Owner's acceptance of the Construction Manager's Guaranteed Maximum Price proposal, the Contract Documents will also include the documents described in Section 3.2.3 and identified in the Guaranteed Maximum Price Amendment and revisions prepared by the Architect and furnished by the Owner as described in Section 3.2.8. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. If anything in the other Contract Documents, other than a Modification, is inconsistent with this Agreement, this Agreement shall govern. An enumeration of the Contract Documents, other than a Modification, appears in Article 15.

§ 2.2 Relationship of the Parties

The Construction Manager accepts the relationship of trust and confidence established by this Agreement and covenants with the Owner to cooperate with the Architect and exercise the Construction Manager's skill and judgment in furthering the interests of the Owner to furnish efficient construction administration, management services, and supervision; to furnish at all times an adequate supply of workers and materials; and to perform the Work in an expeditious and economical manner consistent with the Owner's interests. The Owner agrees to furnish or approve, in a timely manner, information required by the Construction Manager and to make payments to the Construction Manager in accordance with the requirements of the Contract Documents.

§ 2.3 General Conditions

§ 2.3.1 For the Preconstruction Phase, AIA Document A201™-2017, General Conditions of the Contract for Construction, shall apply as follows: Section 1.5, Ownership and Use of Documents; Section 1.7, Digital Data Use and Transmission; Section 1.8, Building Information Model Use and Reliance; Section 2.2.4, Confidential Information; Section 3.12.10, Professional Services; Section 10.3, Hazardous Materials; Section 13.1, Governing Law. The term "Contractor" as used in A201-2017 shall mean the Construction Manager.

§ 2.3.2 For the Construction Phase, the general conditions of the contract shall be as set forth in A201-2017, which document is incorporated herein by reference. The term "Contractor" as used in A201-2017 shall mean the Construction Manager.

ARTICLE 3 CONSTRUCTION MANAGER'S RESPONSIBILITIES

The Construction Manager's Preconstruction Phase responsibilities are set forth in Sections 3.1 and 3.2, and in the applicable provisions of A201-2017 referenced in Section 2.3.1. The Construction Manager's Construction Phase responsibilities are set forth in Section 3.3. The Owner and Construction Manager may agree, in consultation with the Architect, for the Construction Phase to commence prior to completion of the Preconstruction Phase, in which case, both phases will proceed concurrently. The Construction Manager shall identify a representative authorized to act on behalf of the Construction Manager with respect to the Project.

§ 3.1 Preconstruction Phase

§ 3.1.1 Extent of Responsibility

The Construction Manager shall exercise reasonable care in performing its Preconstruction Services. The Owner and Architect shall be entitled to rely on, and shall not be responsible for, the accuracy, completeness, and timeliness of services and information furnished by the Construction Manager. The Construction Manager, however, does not warrant

or guarantee estimates and schedules except as may be included as part of the Guaranteed Maximum Price. The Construction Manager is not required to ascertain that the Drawings and Specifications are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Construction Manager shall promptly report to the Architect and Owner any nonconformity discovered by or made known to the Construction Manager as a request for information in such form as the Architect may require.

§ 3.1.2 The Construction Manager shall provide a preliminary evaluation of the Owner's program, schedule and construction budget requirements, each in terms of the other.

§ 3.1.3 Consultation

§ 3.1.3.1 The Construction Manager shall schedule and conduct meetings with the Architect and Owner to discuss such matters as procedures, progress, coordination, and scheduling of the Work.

§ 3.1.3.2 The Construction Manager shall advise the Owner and Architect on proposed site use and improvements, selection of materials, building systems, and equipment. The Construction Manager shall also provide recommendations to the Owner and Architect, consistent with the Project requirements, on constructability; availability of materials and labor; time requirements for procurement, installation and construction; prefabrication; and factors related to construction cost including, but not limited to, costs of alternative designs or materials, preliminary budgets, life-cycle data, and possible cost reductions. The Construction Manager shall consult with the Architect regarding professional services to be provided by the Construction Manager during the Construction Phase.

§ 3.1.3.3 The Construction Manager shall assist the Owner and Architect in establishing building information modeling and digital data protocols for the Project, using 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.

§ 3.1.4 Project Schedule

When Project requirements in Section 4.1.1 have been sufficiently identified, the Construction Manager shall prepare and periodically update a Project schedule for the Architect's review and the Owner's acceptance. The Construction Manager shall obtain the Architect's approval for the portion of the Project schedule relating to the performance of the Architect's services. The Project schedule shall coordinate and integrate the Construction Manager's services, the Architect's services, other Owner consultants' services, and the Owner's responsibilities; and identify items that affect the Project's timely completion. The updated Project schedule shall include the following: submission of the Guaranteed Maximum Price proposal; components of the Work; times of commencement and completion required of each Subcontractor; ordering and delivery of products, including those that must be ordered in advance of construction; and the occupancy requirements of the Owner.

§ 3.1.5 Phased Construction

The Construction Manager, in consultation with the Architect, shall provide recommendations with regard to accelerated or fast-track scheduling, procurement, and sequencing for phased construction. The Construction Manager shall take into consideration cost reductions, cost information, constructability, provisions for temporary facilities, and procurement and construction scheduling issues.

§ 3.1.6 Cost Estimates

§ 3.1.6.1 Based on the preliminary design and other design criteria prepared by the Architect, the Construction Manager shall prepare, for the Architect's review and the Owner's approval, preliminary estimates of the Cost of the Work or the cost of program requirements using area, volume, or similar conceptual estimating techniques. If the Architect or Construction Manager suggests alternative materials and systems, the Construction Manager shall provide cost evaluations of those alternative materials and systems.

§ 3.1.6.2 As the Architect progresses with the preparation of the Schematic Design, Design Development and Construction Documents, the Construction Manager shall prepare and update, at appropriate intervals agreed to by the Owner, Construction Manager and Architect, an estimate of the Cost of the Work with increasing detail and refinement. The Construction Manager shall include in the estimate those costs to allow for the further development of the design, price escalation, and market conditions, until such time as the Owner and Construction Manager agree on a Guaranteed Maximum Price for the Work. The estimate shall be provided for the Architect's review and the Owner's approval. The Construction Manager shall inform the Owner and Architect in the event that the estimate of the Cost of the Work exceeds the latest approved Project budget, and make recommendations for corrective action.

§ 3.1.6.3 If the Architect is providing cost estimating services as a Supplemental Service, and a discrepancy exists between the Construction Manager's cost estimates and the Architect's cost estimates, the Construction Manager and the Architect shall work together to reconcile the cost estimates.

§ 3.1.7 As the Architect progresses with the preparation of the Schematic Design, Design Development and Construction Documents, the Construction Manager shall consult with the Owner and Architect and make recommendations regarding constructability and schedules, for the Architect's review and the Owner's approval.

§ 3.1.8 The Construction Manager shall provide recommendations and information to the Owner and Architect regarding equipment, materials, services, and temporary Project facilities.

§ 3.1.9 The Construction Manager shall provide a staffing plan for Preconstruction Phase services for the Owner's review and approval.

§ 3.1.10 If the Owner identified a Sustainable Objective in Article 1, the Construction Manager shall fulfill its Preconstruction Phase responsibilities as required in AIA Document E234™-2019, Sustainable Projects Exhibit, Construction Manager as Constructor Edition, attached to this Agreement.

§ 3.1.11 Subcontractors and Suppliers

§ 3.1.11.1 If the Owner has provided requirements for subcontractor procurement in section 1.1.14, the Construction Manager shall provide a subcontracting plan, addressing the Owner's requirements, for the Owner's review and approval.

§ 3.1.11.2 The Construction Manager shall develop bidders' interest in the Project.

§ 3.1.11.3 The processes described in Article 9 shall apply if bid packages will be issued during the Preconstruction Phase.

§ 3.1.12 Procurement

The Construction Manager shall prepare, for the Architect's review and the Owner's acceptance, a procurement schedule for items that must be ordered in advance of construction. The Construction Manager shall expedite and coordinate the ordering and delivery of materials that must be ordered in advance of construction. If the Owner agrees to procure any items prior to the establishment of the Guaranteed Maximum Price, the Owner shall procure the items on terms and conditions acceptable to the Construction Manager. Upon the establishment of the Guaranteed Maximum Price, the Owner shall assign all contracts for these items to the Construction Manager and the Construction Manager shall thereafter accept responsibility for them.

§ 3.1.13 Compliance with Laws

The Construction Manager shall comply with applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to its performance under this Contract, and with equal employment opportunity programs, and other programs as may be required by governmental and quasi-governmental authorities.

§ 3.1.14 Other Preconstruction Services

Insert a description of any other Preconstruction Phase services to be provided by the Construction Manager, or reference an exhibit attached to this document

(Describe any other Preconstruction Phase services, such as providing cash flow projections, development of a project information management system, early selection or procurement of subcontractors, etc.)

<< >>

§ 3.2 Guaranteed Maximum Price Proposal

§ 3.2.1 At a time to be mutually agreed upon by the Owner and the Construction Manager, the Construction Manager shall prepare a Guaranteed Maximum Price proposal for the Owner's and Architect's review, and the Owner's acceptance. The Guaranteed Maximum Price in the proposal shall be the sum of the Construction Manager's estimate of the Cost of the Work, the Construction Manager's contingency described in Section 3.2.4, and the Construction Manager's Fee described in Section 6.1.2.

§ 3.2.2 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Order.

§ 3.2.3 The Construction Manager shall include with the Guaranteed Maximum Price proposal a written statement of its basis, which shall include the following:

- .1 A list of the Drawings and Specifications, including all Addenda thereto, and the Conditions of the Contract;
- .2 A list of the clarifications and assumptions made by the Construction Manager in the preparation of the Guaranteed Maximum Price proposal, including assumptions under Section 3.2.2;
- .3 A statement of the proposed Guaranteed Maximum Price, including a statement of the estimated Cost of the Work organized by trade categories or systems, including allowances; the Construction Manager's contingency set forth in Section 3.2.4; and the Construction Manager's Fee;
- .4 The anticipated date of Substantial Completion upon which the proposed Guaranteed Maximum Price is based; and
- .5 A date by which the Owner must accept the Guaranteed Maximum Price.

§ 3.2.4 In preparing the Construction Manager's Guaranteed Maximum Price proposal, the Construction Manager shall include a contingency for the Construction Manager's exclusive use to cover those costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order.

§ 3.2.5 The Construction Manager shall meet with the Owner and Architect to review the Guaranteed Maximum Price proposal. In the event that the Owner or Architect discover any inconsistencies or inaccuracies in the information presented, they shall promptly notify the Construction Manager, who shall make appropriate adjustments to the Guaranteed Maximum Price proposal, its basis, or both.

§ 3.2.6 If the Owner notifies the Construction Manager that the Owner has accepted the Guaranteed Maximum Price proposal in writing before the date specified in the Guaranteed Maximum Price proposal, the Guaranteed Maximum Price proposal shall be deemed effective without further acceptance from the Construction Manager. Following acceptance of a Guaranteed Maximum Price, the Owner and Construction Manager shall execute the Guaranteed Maximum Price Amendment amending this Agreement, a copy of which the Owner shall provide to the Architect. The Guaranteed Maximum Price Amendment shall set forth the agreed upon Guaranteed Maximum Price with the information and assumptions upon which it is based.

§ 3.2.7 The Construction Manager shall not incur any cost to be reimbursed as part of the Cost of the Work prior to the execution of the Guaranteed Maximum Price Amendment, unless the Owner provides prior written authorization for such costs.

§ 3.2.8 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions and clarifications contained in the Guaranteed Maximum Price Amendment. The Owner shall promptly furnish such revised Contract Documents to the Construction Manager. The Construction Manager shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions and clarifications contained in the Guaranteed Maximum Price Amendment and the revised Contract Documents.

§ 3.2.9 The Construction Manager shall include in the Guaranteed Maximum Price all sales, consumer, use and similar taxes for the Work provided by the Construction Manager that are legally enacted, whether or not yet effective, at the time the Guaranteed Maximum Price Amendment is executed.

§ 3.3 Construction Phase

§ 3.3.1 General

§ 3.3.1.1 For purposes of Section 8.1.2 of A201-2017, the date of commencement of the Work shall mean the date of commencement of the Construction Phase.

§ 3.3.1.2 The Construction Phase shall commence upon the Owner's execution of the Guaranteed Maximum Price Amendment or, prior to acceptance of the Guaranteed Maximum Price proposal, by written agreement of the parties. The

written agreement shall set forth a description of the Work to be performed by the Construction Manager, and any insurance and bond requirements for Work performed prior to execution of the Guaranteed Maximum Price Amendment.

§ 3.3.2 Administration

§ 3.3.2.1 The Construction Manager shall schedule and conduct meetings to discuss such matters as procedures, progress, coordination, scheduling, and status of the Work. The Construction Manager shall prepare and promptly distribute minutes of the meetings to the Owner and Architect.

§ 3.3.2.2 Upon the execution of the Guaranteed Maximum Price Amendment, the Construction Manager shall prepare and submit to the Owner and Architect a construction schedule for the Work and a submittal schedule in accordance with Section 3.10 of A201–2017.

§ 3.3.2.3 Monthly Report

The Construction Manager shall record the progress of the Project. On a monthly basis, or otherwise as agreed to by the Owner, the Construction Manager shall submit written progress reports to the Owner and Architect, showing percentages of completion and other information required by the Owner.

§ 3.3.2.4 Daily Logs

The Construction Manager shall keep, and make available to the Owner and Architect, a daily log containing a record for each day of weather, portions of the Work in progress, number of workers on site, identification of equipment on site, problems that might affect progress of the work, accidents, injuries, and other information required by the Owner.

§ 3.3.2.5 Cost Control

The Construction Manager shall develop a system of cost control for the Work, including regular monitoring of actual costs for activities in progress and estimates for uncompleted tasks and proposed changes. The Construction Manager shall identify variances between actual and estimated costs and report the variances to the Owner and Architect, and shall provide this information in its monthly reports to the Owner and Architect, in accordance with Section 3.3.2.3 above.

ARTICLE 4 OWNER'S RESPONSIBILITIES

§ 4.1 Information and Services Required of the Owner

§ 4.1.1 The Owner shall provide information with reasonable promptness, regarding requirements for and limitations on the Project, including a written program which shall set forth the Owner's objectives, constraints, and criteria, including schedule, space requirements and relationships, flexibility and expandability, special equipment, systems, sustainability and site requirements.

§ 4.1.2 Prior to the execution of the Guaranteed Maximum Price Amendment, the Construction Manager may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. After execution of the Guaranteed Maximum Price Amendment, the Construction Manager may request such information as set forth in A201-2017 Section 2.2.

§ 4.1.3 The Owner shall establish and periodically update the Owner's budget for the Project, including (1) the budget for the Cost of the Work as defined in Article 7, (2) the Owner's other costs, and (3) reasonable contingencies related to all of these costs. If the Owner significantly increases or decreases the Owner's budget for the Cost of the Work, the Owner shall notify the Construction Manager and Architect. The Owner and the Architect, in consultation with the Construction Manager, shall thereafter agree to a corresponding change in the Project's scope and quality.

§ 4.1.4 **Structural and Environmental Tests, Surveys and Reports.** During the Preconstruction Phase, the Owner shall furnish the following information or services with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Construction Manager's performance of the Work with reasonable promptness after receiving the Construction Manager's written request for such information or services. The Construction Manager shall be entitled to rely on the accuracy of information and services furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 4.1.4.1 The Owner shall furnish tests, inspections, and reports, required by law and as otherwise agreed to by the parties, such as structural, mechanical, and chemical tests, tests for air and water pollution, and tests for hazardous materials.

§ 4.1.4.2 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a written legal description of the site. The surveys and legal information shall include, as applicable, grades and lines of streets, alleys, pavements and adjoining property and structures; designated wetlands; adjacent drainage; rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries and contours of the site; locations, dimensions and other necessary data with respect to existing buildings, other improvements and trees; and information concerning available utility services and lines, both public and private, above and below grade, including inverts and depths. All the information on the survey shall be referenced to a Project benchmark.

§ 4.1.4.3 The Owner, when such services are requested, shall furnish services of geotechnical engineers, which may include test borings, test pits, determinations of soil bearing values, percolation tests, evaluations of hazardous materials, seismic evaluation, ground corrosion tests and resistivity tests, including necessary operations for anticipating subsoil conditions, with written reports and appropriate recommendations.

§ 4.1.5 During the Construction Phase, the Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Construction Manager's performance of the Work with reasonable promptness after receiving the Construction Manager's written request for such information or services.

§ 4.1.6 If the Owner identified a Sustainable Objective in Article 1, the Owner shall fulfill its responsibilities as required in AIA Document E234™–2019, Sustainable Projects Exhibit, Construction Manager as Constructor Edition, attached to this Agreement.

§ 4.2 Owner's Designated Representative

The Owner shall identify a representative authorized to act on behalf of the Owner with respect to the Project. The Owner's representative shall render decisions promptly and furnish information expeditiously, so as to avoid unreasonable delay in the services or Work of the Construction Manager. Except as otherwise provided in Section 4.2.1 of A201–2017, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 4.2.1 **Legal Requirements.** The Owner shall furnish all legal, insurance and accounting services, including auditing services, that may be reasonably necessary at any time for the Project to meet the Owner's needs and interests.

§ 4.3 Architect

The Owner shall retain an Architect to provide services, duties and responsibilities as described in AIA Document B133™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Constructor Edition, including any additional services requested by the Construction Manager that are necessary for the Preconstruction and Construction Phase services under this Agreement. The Owner shall provide the Construction Manager with a copy of the scope of services in the executed agreement between the Owner and the Architect, and any further modifications to the Architect's scope of services in the agreement.

ARTICLE 5 COMPENSATION AND PAYMENTS FOR PRECONSTRUCTION PHASE SERVICES

§ 5.1 Compensation

§ 5.1.1 For the Construction Manager's Preconstruction Phase services described in Sections 3.1 and 3.2, the Owner shall compensate the Construction Manager as follows:

(Insert amount of, or basis for, compensation and include a list of reimbursable cost items, as applicable.)

« »

§ 5.1.2 The hourly billing rates for Preconstruction Phase services of the Construction Manager and the Construction Manager's Consultants and Subcontractors, if any, are set forth below.

(If applicable, attach an exhibit of hourly billing rates or insert them below.)

« »

Individual or Position

Rate

§ 5.1.2.1 Hourly billing rates for Preconstruction Phase services include all costs to be paid or incurred by the Construction Manager, as required by law or collective bargaining agreements, for taxes, insurance, contributions, assessments and benefits and, for personnel not covered by collective bargaining agreements, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, and shall remain unchanged unless the parties execute a Modification.

§ 5.1.3 If the Preconstruction Phase services covered by this Agreement have not been completed within « » (« ») months of the date of this Agreement, through no fault of the Construction Manager, the Construction Manager's compensation for Preconstruction Phase services shall be equitably adjusted.

§ 5.2 Payments

§ 5.2.1 Unless otherwise agreed, payments for services shall be made monthly in proportion to services performed.

§ 5.2.2 Payments are due and payable upon presentation of the Construction Manager's invoice. Amounts unpaid « » (« ») days after the invoice date shall bear interest at the rate entered below, or in the absence thereof at the legal rate prevailing from time to time at the principal place of business of the Construction Manager.
(Insert rate of monthly or annual interest agreed upon.)

« » % « »

ARTICLE 6 COMPENSATION FOR CONSTRUCTION PHASE SERVICES

§ 6.1 Contract Sum

§ 6.1.1 The Owner shall pay the Construction Manager the Contract Sum in current funds for the Construction Manager's performance of the Contract after execution of the Guaranteed Maximum Price Amendment. The Contract Sum is the Cost of the Work as defined in Article 7 plus the Construction Manager's Fee.

§ 6.1.2 The Construction Manager's Fee:

(State a lump sum, percentage of Cost of the Work or other provision for determining the Construction Manager's Fee.)

« »

§ 6.1.3 The method of adjustment of the Construction Manager's Fee for changes in the Work:

« »

§ 6.1.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

« »

§ 6.1.5 Rental rates for Construction Manager-owned equipment shall not exceed « » percent (« » %) of the standard rental rate paid at the place of the Project.

§ 6.1.6 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

« »

§ 6.1.7 Other:

(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)

« »

§ 6.2 Guaranteed Maximum Price

The Construction Manager guarantees that the Contract Sum shall not exceed the Guaranteed Maximum Price set forth in the Guaranteed Maximum Price Amendment, subject to additions and deductions by Change Order as provided in the Contract Documents. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Construction Manager without reimbursement by the Owner.

§ 6.3 Changes in the Work

§ 6.3.1 The Owner may, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions. The Owner shall issue such changes in writing. The Construction Manager may be entitled to an equitable adjustment in the Contract Time as a result of changes in the Work.

§ 6.3.1.1 The Architect may order minor changes in the Work as provided in Article 7 of AIA Document A201–2017, General Conditions of the Contract for Construction.

§ 6.3.2 Adjustments to the Guaranteed Maximum Price on account of changes in the Work subsequent to the execution of the Guaranteed Maximum Price Amendment may be determined by any of the methods listed in Article 7 of AIA Document A201–2017, General Conditions of the Contract for Construction.

§ 6.3.3 Adjustments to subcontracts awarded on the basis of a stipulated sum shall be determined in accordance with Article 7 of A201–2017, as they refer to “cost” and “fee,” and not by Articles 6 and 7 of this Agreement. Adjustments to subcontracts awarded with the Owner’s prior written consent on the basis of cost plus a fee shall be calculated in accordance with the terms of those subcontracts.

§ 6.3.4 In calculating adjustments to the Guaranteed Maximum Price, the terms “cost” and “costs” as used in Article 7 of AIA Document A201–2017 shall mean the Cost of the Work as defined in Article 7 of this Agreement and the term “fee” shall mean the Construction Manager’s Fee as defined in Section 6.1.2 of this Agreement.

§ 6.3.5 If no specific provision is made in Section 6.1.3 for adjustment of the Construction Manager’s Fee in the case of changes in the Work, or if the extent of such changes is such, in the aggregate, that application of the adjustment provisions of Section 6.1.3 will cause substantial inequity to the Owner or Construction Manager, the Construction Manager’s Fee shall be equitably adjusted on the same basis that was used to establish the Fee for the original Work, and the Guaranteed Maximum Price shall be adjusted accordingly.

ARTICLE 7 COST OF THE WORK FOR CONSTRUCTION PHASE

§ 7.1 Costs to Be Reimbursed

§ 7.1.1 The term Cost of the Work shall mean costs necessarily incurred by the Construction Manager in the proper performance of the Work. The Cost of the Work shall include only the items set forth in Sections 7.1 through 7.7.

§ 7.1.2 Where, pursuant to the Contract Documents, any cost is subject to the Owner’s prior approval, the Construction Manager shall obtain such approval in writing prior to incurring the cost.

§ 7.1.3 Costs shall be at rates not higher than the standard rates paid at the place of the Project, except with prior approval of the Owner.

§ 7.2 Labor Costs

§ 7.2.1 Wages or salaries of construction workers directly employed by the Construction Manager to perform the construction of the Work at the site or, with the Owner’s prior approval, at off-site workshops.

§ 7.2.2 Wages or salaries of the Construction Manager’s supervisory and administrative personnel when stationed at the site and performing Work, with the Owner’s prior approval.

§ 7.2.2.1 Wages or salaries of the Construction Manager’s supervisory and administrative personnel when performing Work and stationed at a location other than the site, but only for that portion of time required for the Work, and limited to the personnel and activities listed below:

(Identify the personnel, type of activity and, if applicable, any agreed upon percentage of time to be devoted to the Work.)

« »

§ 7.2.3 Wages and salaries of the Construction Manager’s supervisory or administrative personnel engaged at factories, workshops or while traveling, in expediting the production or transportation of materials or equipment required for the Work, but only for that portion of their time required for the Work.

§ 7.2.4 Costs paid or incurred by the Construction Manager, as required by law or collective bargaining agreements, for taxes, insurance, contributions, assessments and benefits and, for personnel not covered by collective bargaining agreements, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under Sections 7.2.1 through 7.2.3.

§ 7.2.5 If agreed rates for labor costs, in lieu of actual costs, are provided in this Agreement, the rates shall remain unchanged throughout the duration of this Agreement, unless the parties execute a Modification.

§ 7.3 Subcontract Costs

Payments made by the Construction Manager to Subcontractors in accordance with the requirements of the subcontracts and this Agreement.

§ 7.4 Costs of Materials and Equipment Incorporated in the Completed Construction

§ 7.4.1 Costs, including transportation and storage at the site, of materials and equipment incorporated, or to be incorporated, in the completed construction.

§ 7.4.2 Costs of materials described in the preceding Section 7.4.1 in excess of those actually installed to allow for reasonable waste and spoilage. Unused excess materials, if any, shall become the Owner's property at the completion of the Work or, at the Owner's option, shall be sold by the Construction Manager. Any amounts realized from such sales shall be credited to the Owner as a deduction from the Cost of the Work.

§ 7.5 Costs of Other Materials and Equipment, Temporary Facilities and Related Items

§ 7.5.1 Costs of transportation, storage, installation, dismantling, maintenance, and removal of materials, supplies, temporary facilities, machinery, equipment and hand tools not customarily owned by construction workers that are provided by the Construction Manager at the site and fully consumed in the performance of the Work. Costs of materials, supplies, temporary facilities, machinery, equipment, and tools, that are not fully consumed, shall be based on the cost or value of the item at the time it is first used on the Project site less the value of the item when it is no longer used at the Project site. Costs for items not fully consumed by the Construction Manager shall mean fair market value.

§ 7.5.2 Rental charges for temporary facilities, machinery, equipment, and hand tools not customarily owned by construction workers that are provided by the Construction Manager at the site, and the costs of transportation, installation, dismantling, minor repairs, and removal of such temporary facilities, machinery, equipment, and hand tools. Rates and quantities of equipment owned by the Construction Manager, or a related party as defined in Section 7.8, shall be subject to the Owner's prior approval. The total rental cost of any such equipment may not exceed the purchase price of any comparable item.

§ 7.5.3 Costs of removal of debris from the site of the Work and its proper and legal disposal.

§ 7.5.4 Costs of the Construction Manager's site office, including general office equipment and supplies.

§ 7.5.5 Costs of materials and equipment suitably stored off the site at a mutually acceptable location, subject to the Owner's prior approval.

§ 7.6 Miscellaneous Costs

§ 7.6.1 Premiums for that portion of insurance and bonds required by the Contract Documents that can be directly attributed to this Contract.

§ 7.6.1.1 Costs for self-insurance, for either full or partial amounts of the coverages required by the Contract Documents, with the Owner's prior approval.

§ 7.6.1.2 Costs for insurance through a captive insurer owned or controlled by the Construction Manager, with the Owner's prior approval.

§ 7.6.2 Sales, use, or similar taxes, imposed by a governmental authority, that are related to the Work and for which the Construction Manager is liable.

§ 7.6.3 Fees and assessments for the building permit, and for other permits, licenses, and inspections, for which the Construction Manager is required by the Contract Documents to pay.

§ 7.6.4 Fees of laboratories for tests required by the Contract Documents; except those related to defective or nonconforming Work for which reimbursement is excluded under Article 13 of AIA Document A201–2017 or by other provisions of the Contract Documents, and which do not fall within the scope of Section 7.7.3.

§ 7.6.5 Royalties and license fees paid for the use of a particular design, process, or product, required by the Contract Documents.

§ 7.6.5.1 The cost of defending suits or claims for infringement of patent rights arising from requirements of the Contract Documents, payments made in accordance with legal judgments against the Construction Manager resulting from such suits or claims, and payments of settlements made with the Owner's consent, unless the Construction Manager had reason to believe that the required design, process, or product was an infringement of a copyright or a patent, and the Construction Manager failed to promptly furnish such information to the Architect as required by Article 3 of AIA Document A201–2017. The costs of legal defenses, judgments, and settlements shall not be included in the Cost of the Work used to calculate the Construction Manager's Fee or subject to the Guaranteed Maximum Price.

§ 7.6.6 Costs for communications services, electronic equipment, and software, directly related to the Work and located at the site, with the Owner's prior approval.

§ 7.6.7 Costs of document reproductions and delivery charges.

§ 7.6.8 Deposits lost for causes other than the Construction Manager's negligence or failure to fulfill a specific responsibility in the Contract Documents.

§ 7.6.9 Legal, mediation and arbitration costs, including attorneys' fees, other than those arising from disputes between the Owner and Construction Manager, reasonably incurred by the Construction Manager after the execution of this Agreement in the performance of the Work and with the Owner's prior approval, which shall not be unreasonably withheld.

§ 7.6.10 Expenses incurred in accordance with the Construction Manager's standard written personnel policy for relocation and temporary living allowances of the Construction Manager's personnel required for the Work, with the Owner's prior approval.

§ 7.6.11 That portion of the reasonable expenses of the Construction Manager's supervisory or administrative personnel incurred while traveling in discharge of duties connected with the Work.

§ 7.7 Other Costs and Emergencies

§ 7.7.1 Other costs incurred in the performance of the Work, with the Owner's prior approval.

§ 7.7.2 Costs incurred in taking action to prevent threatened damage, injury, or loss, in case of an emergency affecting the safety of persons and property, as provided in Article 10 of AIA Document A201–2017.

§ 7.7.3 Costs of repairing or correcting damaged or nonconforming Work executed by the Construction Manager, Subcontractors, or suppliers, provided that such damaged or nonconforming Work was not caused by the negligence of, or failure to fulfill a specific responsibility by, the Construction Manager, and only to the extent that the cost of repair or correction is not recovered by the Construction Manager from insurance, sureties, Subcontractors, suppliers, or others.

§ 7.7.4 The costs described in Sections 7.1 through 7.7 shall be included in the Cost of the Work, notwithstanding any provision of AIA Document A201–2017 or other Conditions of the Contract which may require the Construction Manager to pay such costs, unless such costs are excluded by the provisions of Section 7.9.

§ 7.8 Related Party Transactions

§ 7.8.1 For purposes of this Section 7.8, the term "related party" shall mean (1) a parent, subsidiary, affiliate, or other entity having common ownership of, or sharing common management with, the Construction Manager; (2) any entity in which any stockholder in, or management employee of, the Construction Manager holds an equity interest in excess of ten percent in the aggregate; (3) any entity which has the right to control the business or affairs of the Construction Manager;

or (4) any person, or any member of the immediate family of any person, who has the right to control the business or affairs of the Construction Manager.

§ 7.8.2 If any of the costs to be reimbursed arise from a transaction between the Construction Manager and a related party, the Construction Manager shall notify the Owner of the specific nature of the contemplated transaction, including the identity of the related party and the anticipated cost to be incurred, before any such transaction is consummated or cost incurred. If the Owner, after such notification, authorizes the proposed transaction in writing, then the cost incurred shall be included as a cost to be reimbursed, and the Construction Manager shall procure the Work, equipment, goods, or service, from the related party, as a Subcontractor, according to the terms of Article 9. If the Owner fails to authorize the transaction in writing, the Construction Manager shall procure the Work, equipment, goods, or service from some person or entity other than a related party according to the terms of Article 9.

§ 7.9 Costs Not To Be Reimbursed

§ 7.9.1 The Cost of the Work shall not include the items listed below:

- .1 Salaries and other compensation of the Construction Manager's personnel stationed at the Construction Manager's principal office or offices other than the site office, except as specifically provided in Section 7.2, or as may be provided in Article 14;
- .2 Bonuses, profit sharing, incentive compensation, and any other discretionary payments, paid to anyone hired by the Construction Manager or paid to any Subcontractor or vendor, unless the Owner has provided prior approval;
- .3 Expenses of the Construction Manager's principal office and offices other than the site office;
- .4 Overhead and general expenses, except as may be expressly included in Sections 7.1 to 7.7;
- .5 The Construction Manager's capital expenses, including interest on the Construction Manager's capital employed for the Work;
- .6 Except as provided in Section 7.7.3 of this Agreement, costs due to the negligence of, or failure to fulfill a specific responsibility of the Contract by, the Construction Manager, Subcontractors, and suppliers, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable;
- .7 Any cost not specifically and expressly described in Sections 7.1 to 7.7;
- .8 Costs, other than costs included in Change Orders approved by the Owner, that would cause the Guaranteed Maximum Price to be exceeded; and
- .9 Costs for services incurred during the Preconstruction Phase.

ARTICLE 8 DISCOUNTS, REBATES, AND REFUNDS

§ 8.1 Cash discounts obtained on payments made by the Construction Manager shall accrue to the Owner if (1) before making the payment, the Construction Manager included the amount to be paid, less such discount, in an Application for Payment and received payment from the Owner, or (2) the Owner has deposited funds with the Construction Manager with which to make payments; otherwise, cash discounts shall accrue to the Construction Manager. Trade discounts, rebates, refunds, and amounts received from sales of surplus materials and equipment shall accrue to the Owner, and the Construction Manager shall make provisions so that they can be obtained.

§ 8.2 Amounts that accrue to the Owner in accordance with the provisions of Section 8.1 shall be credited to the Owner as a deduction from the Cost of the Work.

ARTICLE 9 SUBCONTRACTS AND OTHER AGREEMENTS

§ 9.1 Those portions of the Work that the Construction Manager does not customarily perform with the Construction Manager's own personnel shall be performed under subcontracts or other appropriate agreements with the Construction Manager. The Owner may designate specific persons from whom, or entities from which, the Construction Manager shall obtain bids. The Construction Manager shall obtain bids from Subcontractors, and from suppliers of materials or equipment fabricated especially for the Work, who are qualified to perform that portion of the Work in accordance with the requirements of the Contract Documents. The Construction Manager shall deliver such bids to the Architect and Owner with an indication as to which bids the Construction Manager intends to accept. The Owner then has the right to review the Construction Manager's list of proposed subcontractors and suppliers in consultation with the Architect and, subject to Section 9.1.1, to object to any subcontractor or supplier. Any advice of the Architect, or approval or objection by the Owner, shall not relieve the Construction Manager of its responsibility to perform the Work in accordance with the Contract Documents. The Construction Manager shall not be required to contract with anyone to whom the Construction Manager has reasonable objection.

§ 9.1.1 When a specific subcontractor or supplier (1) is recommended to the Owner by the Construction Manager; (2) is qualified to perform that portion of the Work; and (3) has submitted a bid that conforms to the requirements of the Contract Documents without reservations or exceptions, but the Owner requires that another bid be accepted, then the Construction Manager may require that a Change Order be issued to adjust the Guaranteed Maximum Price by the difference between the bid of the person or entity recommended to the Owner by the Construction Manager and the amount of the subcontract or other agreement actually signed with the person or entity designated by the Owner.

§ 9.2 Subcontracts or other agreements shall conform to the applicable payment provisions of this Agreement, and shall not be awarded on the basis of cost plus a fee without the Owner's prior written approval. If a subcontract is awarded on the basis of cost plus a fee, the Construction Manager shall provide in the subcontract for the Owner to receive the same audit rights with regard to the Subcontractor as the Owner receives with regard to the Construction Manager in Article 10.

ARTICLE 10 ACCOUNTING RECORDS

The Construction Manager shall keep full and detailed records and accounts related to the Cost of the Work, and exercise such controls, as may be necessary for proper financial management under this Contract and to substantiate all costs incurred. The accounting and control systems shall be satisfactory to the Owner. The Owner and the Owner's auditors shall, during regular business hours and upon reasonable notice, be afforded access to, and shall be permitted to audit and copy, the Construction Manager's records and accounts, including complete documentation supporting accounting entries, books, job cost reports, correspondence, instructions, drawings, receipts, subcontracts, Subcontractor's proposals, Subcontractor's invoices, purchase orders, vouchers, memoranda, and other data relating to this Contract. The Construction Manager shall preserve these records for a period of three years after final payment, or for such longer period as may be required by law.

ARTICLE 11 PAYMENTS FOR CONSTRUCTION PHASE SERVICES

§ 11.1 Progress Payments

§ 11.1.1 Based upon Applications for Payment submitted to the Architect by the Construction Manager, and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum, to the Construction Manager, as provided below and elsewhere in the Contract 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 that an Application for Payment is received by the Architect not later than the « » day of a month, the Owner shall make payment of the amount certified to the Construction Manager not later than the « » day of the « » month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than « » (« ») days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 11.1.4 With each Application for Payment, the Construction Manager shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner or Architect to demonstrate that payments already made by the Construction Manager on account of the Cost of the Work equal or exceed progress payments already received by the Construction Manager, plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Construction Manager's Fee.

§ 11.1.5 Each Application for Payment shall be based on the most recent schedule of values submitted by the Construction Manager in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Construction Manager's Fee.

§ 11.1.5.1 The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. The schedule of values shall be used as a basis for reviewing the Construction Manager's Applications for Payment.

§ 11.1.5.2 The allocation of the Guaranteed Maximum Price under this Section 11.1.5 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.

§ 11.1.5.3 When the Construction Manager allocates costs from a contingency to another line item in the schedule of values, the Construction Manager shall submit supporting documentation to the Architect.

§ 11.1.6 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed, or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Construction Manager on account of that portion of the Work and for which the Construction Manager has made payment or intends to make payment prior to the next Application for Payment, by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

§ 11.1.7 In accordance with AIA Document A201–2017 and subject to other provisions of the Contract 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 Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the most recent schedule of values;
- .2 That portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and
- .4 The Construction Manager's Fee, computed upon the Cost of the Work described in the preceding Sections 11.1.7.1.1 and 11.1.7.1.2 at the rate stated in Section 6.1.2 or, if the Construction Manager's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work included in Sections 11.1.7.1.1 and 11.1.7.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

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

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Construction Manager does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Construction Manager intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017;
- .5 The shortfall, if any, indicated by the Construction Manager in the documentation required by Section 11.1.4 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and
- .6 Retainage withheld pursuant to Section 11.1.8.

§ 11.1.8 Retainage

§ 11.1.8.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, 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.)

« »

§ 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, insert provisions for such modification.)

« »

§ 11.1.8.3 Except as set forth in this Section 11.1.8.3, upon Substantial Completion of the Work, the Construction Manager may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 11.1.8. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage, such as upon completion of the Owner's audit and reconciliation, upon Substantial Completion.)

« »

§ 11.1.9 If final completion of the Work is materially delayed through no fault of the Construction Manager, the Owner shall pay the Construction Manager any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 11.1.10 Except with the Owner's prior written approval, the Construction Manager shall not make advance payments to suppliers for materials or equipment which have not been delivered and suitably stored at the site.

§ 11.1.11 The Owner and the Construction Manager shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors, and the percentage of retainage held on Subcontracts, and the Construction Manager shall execute subcontracts in accordance with those agreements.

§ 11.1.12 In taking action on the Construction Manager's Applications for Payment the Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Construction Manager, and such action shall not be deemed to be a representation that (1) the Architect has made a detailed examination, audit, or arithmetic verification, of the documentation submitted in accordance with Section 11.1.4 or other supporting data; (2) that the Architect has made exhaustive or continuous on-site inspections; or (3) that the Architect has made examinations to ascertain how or for what purposes the Construction Manager has used amounts previously paid on account of the Contract. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

§ 11.2 Final Payment

§ 11.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Construction Manager when

- .1 the Construction Manager has fully performed the Contract, except for the Construction Manager's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment;
- .2 the Construction Manager has submitted a final accounting for the Cost of the Work and a final Application for Payment; and
- .3 a final Certificate for Payment has been issued by the Architect in accordance with Section 11.2.2.2.

§ 11.2.2 Within 30 days of the Owner's receipt of the Construction Manager's final accounting for the Cost of the Work, the Owner shall conduct an audit of the Cost of the Work or notify the Architect that it will not conduct an audit.

§ 11.2.2.1 If the Owner conducts an audit of the Cost of the Work, the Owner shall, within 10 days after completion of the audit, submit a written report based upon the auditors' findings to the Architect.

§ 11.2.2.2 Within seven days after receipt of the written report described in Section 11.2.2.1, or receipt of notice that the Owner will not conduct an audit, and provided that the other conditions of Section 11.2.1 have been met, the Architect will either issue to the Owner a final Certificate for Payment with a copy to the Construction Manager, or notify the Construction Manager and Owner in writing of the Architect's reasons for withholding a certificate as provided in Article 9 of AIA Document A201–2017. The time periods stated in this Section 11.2.2 supersede those stated in Article 9 of AIA

Document A201–2017. The Architect is not responsible for verifying the accuracy of the Construction Manager’s final accounting.

§ 11.2.2.3 If the Owner’s auditors’ report concludes that the Cost of the Work, as substantiated by the Construction Manager’s final accounting, is less than claimed by the Construction Manager, the Construction Manager shall be entitled to request mediation of the disputed amount without seeking an initial decision pursuant to Article 15 of AIA Document A201–2017. A request for mediation shall be made by the Construction Manager within 30 days after the Construction Manager’s receipt of a copy of the Architect’s final Certificate for Payment. Failure to request mediation within this 30-day period shall result in the substantiated amount reported by the Owner’s auditors becoming binding on the Construction Manager. Pending a final resolution of the disputed amount, the Owner shall pay the Construction Manager the amount certified in the Architect’s final Certificate for Payment.

§ 11.2.3 The Owner’s final payment to the Construction Manager shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

« »

§ 11.2.4 If, subsequent to final payment, and at the Owner’s request, the Construction Manager incurs costs, described in Sections 7.1 through 7.7, and not excluded by Section 7.9, to correct defective or nonconforming Work, the Owner shall reimburse the Construction Manager for such costs, and the Construction Manager’s Fee applicable thereto, on the same basis as if such costs had been incurred prior to final payment, but not in excess of the Guaranteed Maximum Price. If adjustments to the Contract Sum are provided for in Section 6.1.7, the amount of those adjustments shall be recalculated, taking into account any reimbursements made pursuant to this Section 11.2.4 in determining the net amount to be paid by the Owner to the Construction Manager.

§ 11.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, 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 DISPUTE RESOLUTION

§ 12.1 Initial Decision Maker

§ 12.1.1 Any Claim between the Owner and Construction Manager shall be resolved in accordance with the provisions set forth in this Article 12 and Article 15 of A201–2017. However, for Claims arising from or relating to the Construction Manager’s Preconstruction Phase services, no decision by the Initial Decision Maker shall be required as a condition precedent to mediation or binding dispute resolution, and Section 12.1.2 of this Agreement shall not apply.

§ 12.1.2 The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017 for Claims arising from or relating to the Construction Manager’s Construction Phase services, unless the parties appoint below another individual, not a party to the Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

« »

« »

« »

« »

§ 12.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

[« »] Arbitration pursuant to Article 15 of AIA Document A201–2017

[« »] Litigation in a court of competent jurisdiction

[« »] Other: *(Specify)*

« »

If the Owner and Construction Manager 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.

ARTICLE 13 TERMINATION OR SUSPENSION

§ 13.1 Termination Prior to Execution of the Guaranteed Maximum Price Amendment

§ 13.1.1 If the Owner and the Construction Manager do not reach an agreement on the Guaranteed Maximum Price, the Owner may terminate this Agreement upon not less than seven days' written notice to the Construction Manager, and the Construction Manager may terminate this Agreement, upon not less than seven days' written notice to the Owner.

§ 13.1.2 In the event of termination of this Agreement pursuant to Section 13.1.1, the Construction Manager shall be compensated for Preconstruction Phase services and Work performed prior to receipt of a notice of termination, in accordance with the terms of this Agreement. In no event shall the Construction Manager's compensation under this Section exceed the compensation set forth in Section 5.1.

§ 13.1.3 Prior to the execution of the Guaranteed Maximum Price Amendment, the Owner may terminate this Agreement upon not less than seven days' written notice to the Construction Manager for the Owner's convenience and without cause, and the Construction Manager may terminate this Agreement, upon not less than seven days' written notice to the Owner, for the reasons set forth in Article 14 of A201-2017.

§ 13.1.4 In the event of termination of this Agreement pursuant to Section 13.1.3, the Construction Manager shall be equitably compensated for Preconstruction Phase services and Work performed prior to receipt of a notice of termination. In no event shall the Construction Manager's compensation under this Section exceed the compensation set forth in Section 5.1.

§ 13.1.5 If the Owner terminates the Contract pursuant to Section 13.1.3 after the commencement of the Construction Phase but prior to the execution of the Guaranteed Maximum Price Amendment, the Owner shall pay to the Construction Manager an amount calculated as follows, which amount shall be in addition to any compensation paid to the Construction Manager under Section 13.1.4:

- .1 Take the Cost of the Work incurred by the Construction Manager to the date of termination;
- .2 Add the Construction Manager's Fee computed upon the Cost of the Work to the date of termination at the rate stated in Section 6.1 or, if the Construction Manager's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion; and
- .3 Subtract the aggregate of previous payments made by the Owner for Construction Phase services.

§ 13.1.6 The Owner shall also pay the Construction Manager fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Construction Manager that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 13.1.5.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Construction Manager shall, as a condition of receiving the payments referred to in this Article 13, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Construction Manager, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Construction Manager under such subcontracts or purchase orders. All Subcontracts, purchase orders and rental agreements entered into by the Construction Manager will contain provisions allowing for assignment to the Owner as described above.

§ 13.1.6.1 If the Owner accepts assignment of subcontracts, purchase orders or rental agreements as described above, the Owner will reimburse or indemnify the Construction Manager for all costs arising under the subcontract, purchase order or rental agreement, if those costs would have been reimbursable as Cost of the Work if the contract had not been terminated. If the Owner chooses not to accept assignment of any subcontract, purchase order or rental agreement that would have constituted a Cost of the Work had this agreement not been terminated, the Construction Manager will

terminate the subcontract, purchase order or rental agreement and the Owner will pay the Construction Manager the costs necessarily incurred by the Construction Manager because of such termination.

§ 13.2 Termination or Suspension Following Execution of the Guaranteed Maximum Price Amendment

§ 13.2.1 Termination

The Contract may be terminated by the Owner or the Construction Manager as provided in Article 14 of AIA Document A201–2017.

§ 13.2.2 Termination by the Owner for Cause

§ 13.2.2.1 If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A201–2017, the amount, if any, to be paid to the Construction Manager under Article 14 of AIA Document A201–2017 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed an amount calculated as follows:

- .1 Take the Cost of the Work incurred by the Construction Manager to the date of termination;
- .2 Add the Construction Manager's Fee, computed upon the Cost of the Work to the date of termination at the rate stated in Section 6.1 or, if the Construction Manager's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion;
- .3 Subtract the aggregate of previous payments made by the Owner; and
- .4 Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A201–2017.

§ 13.2.2.2 The Owner shall also pay the Construction Manager fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Construction Manager that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 13.2.2.1.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Construction Manager shall, as a condition of receiving the payments referred to in this Article 13, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Construction Manager, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Construction Manager under such subcontracts or purchase orders.

§ 13.2.3 Termination by the Owner for Convenience

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Construction Manager a termination fee as follows:

(Insert the amount of or method for determining the fee, if any, payable to the Construction Manager following a termination for the Owner's convenience.)

« »

§ 13.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017; in such case, the Guaranteed Maximum Price and Contract Time shall be increased as provided in Article 14 of AIA Document A201–2017, except that the term “profit” shall be understood to mean the Construction Manager's Fee as described in Sections 6.1 and 6.3.5 of this Agreement.

ARTICLE 14 MISCELLANEOUS PROVISIONS

§ 14.1 Terms in this Agreement shall have the same meaning as those in A201–2017. Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 14.2 Successors and Assigns

§ 14.2.1 The Owner and Construction Manager, respectively, bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 14.2.2 of this Agreement, and in Section 13.2.2 of A201–2017, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 14.2.2 The Owner may, without consent of the Construction Manager, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Construction Manager shall execute all consents reasonably required to facilitate the assignment.

§ 14.3 Insurance and Bonds

§ 14.3.1 Preconstruction Phase

The Construction Manager shall maintain the following insurance for the duration of the Preconstruction Services performed under this Agreement. If any of the requirements set forth below exceed the types and limits the Construction Manager normally maintains, the Owner shall reimburse the Construction Manager for any additional cost.

§ 14.3.1.1 Commercial General Liability with policy limits of not less than « » (\$ « ») for each occurrence and « » (\$ « ») in the aggregate for bodily injury and property damage.

§ 14.3.1.2 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Construction Manager with policy limits of not less than « » (\$ « ») per accident for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles, along with any other statutorily required automobile coverage.

§ 14.3.1.3 The Construction Manager may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided that such primary and excess or umbrella liability insurance policies result in the same or greater coverage as the coverages required under Sections 14.3.1.1 and 14.3.1.2, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ 14.3.1.4 Workers' Compensation at statutory limits and Employers Liability with policy limits not less than « » (\$ « ») each accident, « » (\$ « ») each employee, and « » (\$ « ») policy limit.

§ 14.3.1.5 Professional Liability covering negligent acts, errors and omissions in the performance of professional services, with policy limits of not less than « » (\$ « ») per claim and « » (\$ « ») in the aggregate.

§ 14.3.1.6 Other Insurance

(List below any other insurance coverage to be provided by the Construction Manager and any applicable limits.)

| Coverage | Limits |
|----------|--------|
| | |

§ 14.3.1.7 **Additional Insured Obligations.** To the fullest extent permitted by law, the Construction Manager shall cause the primary and excess or umbrella policies for Commercial General Liability and Automobile Liability to include the Owner as an additional insured for claims caused in whole or in part by the Construction Manager's negligent acts or omissions. The additional insured coverage shall be primary and non-contributory to any of the Owner's insurance policies and shall apply to both ongoing and completed operations.

§ 14.3.1.8 The Construction Manager shall provide certificates of insurance to the Owner that evidence compliance with the requirements in this Section 14.3.1.

§ 14.3.2 Construction Phase

After execution of the Guaranteed Maximum Price Amendment, the Owner and the Construction Manager shall purchase and maintain insurance as set forth in AIA Document A133™-2019, Standard Form of Agreement Between Owner and Construction Manager as Constructor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price, Exhibit B, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 14.3.2.1 The Construction Manager shall provide bonds as set forth in AIA Document A133™-2019 Exhibit B, and elsewhere in the Contract Documents.

§ 14.4 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, 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 Other provisions:

« »

ARTICLE 15 SCOPE OF THE AGREEMENT

§ 15.1 This Agreement represents the entire and integrated agreement between the Owner and the Construction Manager and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both Owner and Construction Manager.

§ 15.2 The following documents comprise the Agreement:

- .1 AIA Document A133™–2019, Standard Form of Agreement Between Owner and Construction Manager as Constructor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price
- .2 AIA Document A133™–2019, Exhibit A, Guaranteed Maximum Price Amendment, if executed
- .3 AIA Document A133™–2019, Exhibit B, Insurance and Bonds
- .4 AIA Document A201™–2017, General Conditions of the Contract for Construction
- .5 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

« »

- .6 Other Exhibits:
(Check all boxes that apply.)

AIA Document E234™–2019, Sustainable Projects Exhibit, Construction Manager as Constructor Edition, dated as indicated below:
(Insert the date of the E234-2019 incorporated into this Agreement.)

« »

Supplementary and other Conditions of the Contract:

| Document | Title | Date | Pages |
|----------|-------|------|-------|
| | | | |

- .7 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Construction Manager’s bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

« »

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

OWNER *(Signature)*

« »« »

(Printed name and title)

CONSTRUCTION MANAGER *(Signature)*

« »« »

(Printed name and title)

REBAR



SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

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. 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. Division 01 Section "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 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. Salvage existing face brick, pre-cast lintels, pre-cast trim, pre-cast sills, etc.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

1. Carefully salvage in a manner to prevent damage and store for re-use.

1.5 PREINSTALLATION MEETINGS

- A. Pre-demolition 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.

1.6 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. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 3. Coordination for shutoff, capping, and continuation of utility services.
- D. Pre-demolition Photographs or Video: Submit before Work begins.
- E. 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.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

1.8 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 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.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. All loose equipment, fixtures and furnishings
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces and openings, including temporary protection, by 12 inches or more.
- E. Storage or sale of removed items or materials on-site is not permitted.

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/ASSE 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 record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Consult Project Structural Engineer with concerns of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of photographs.
 - 1. Comply with requirements specified in Division 01 Section "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.
 - 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work (such as exterior pre-cast trim), make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. 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.
 - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated 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.



Renovations and Additions North Main Annex

April 27, 2022

Bid Set

- b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

- A. 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.
 - 1. Comply with requirements for access and protection specified in Division 01 Section "Temporary Facilities and Controls."
- B. Temporary Facilities: 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.
- C. Temporary Shoring: 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.

3.4 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 chopping, to minimize disturbance of adjacent surfaces. 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 adequate ventilation when using cutting torches.
 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 9. Dispose of demolished items and materials promptly. Comply with requirements in Division 01 Section "Construction Waste Management and Disposal"
- B. Reuse of Building Elements: Project has been designed to result in end-of-Project rates for reuse of building elements as follows. Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
1. **Protect columns, cornice and trim to remain or reuse at the old drive-thru/existing H.C. side entry. Protect all existing cast stone to be removed. Salvage existing brick to the greatest extent possible. Re-use will be determined based on the condition of each material after removal. Protect all existing lobby finishes. Decorative fixtures to be removed should be protected, stored and handed over to the Owner.**
- C. 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.
- D. 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.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

3.5 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, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, 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.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 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 Division 01 Section "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 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.

3.8 SELECTIVE DEMOLITION SCHEDULE

- A. Existing Construction to Be Removed: As indicated on Demolition Drawings.
- B. Existing Items to Be Removed and Reinstalled: As indicated on Architectural and Demolition Drawings.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

C. Existing Items to Remain: As indicated on Architectural Drawings

END OF SECTION 024119



SECTION 040120 - MAINTENANCE OF 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 maintenance of unit masonry consisting of brick and cast stone restoration and cleaning as follows:
 - 1. Unused anchor removal.
 - 2. Repairing unit masonry, including replacing units at new openings.

1.3 ALLOWANCES

- A. Allowances for masonry restoration and cleaning are per Contract Documents.
 - 1. **Contractor to include an allowance of \$2,500 for the tuck and point of existing masonry walls where they adjoin new brick. All visible cracks in the existing mortar and/or bricks should be addressed and the finish repaired to match surrounding new brick.**
 - 2. Notify Architect weekly of extent of work performed that is attributable to quantity allowances.
 - 3. Perform work that exceeds quantity allowances only as authorized by Change Orders.
- B. Remove unused anchors as part of masonry maintenance allowance.
- C. Patch and re-point masonry units as part of masonry maintenance allowance.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include recommendations for application and use. Include test data substantiating that products comply with requirements.
- B. Samples for Initial Selection: For the following:



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of masonry representative of the range of masonry colors on the building.
 - a. Have each set contain a close color range of at least six Samples of different mixes of patching compound that matches the variations in existing masonry when cured and dry.
2. Sealant Materials: See Division 07 Section "Joint Sealants."
3. Include similar Samples of accessories involving color selection.
4. Submit samples of Replacement Brick to match existing if needed.

C. Samples for Verification: For the following:

1. Each type of masonry unit to be used for replacing existing units.
2. Each type of masonry patching compound in the form of briquettes
3. Sealant Materials: See Division 07 Section "Joint Sealants."

1.5 QUALITY ASSURANCE

- A. Restoration Specialist Qualifications: Engage an experienced masonry restoration and cleaning firm to perform work of this Section. Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance. Experience installing standard unit masonry is not sufficient experience for masonry restoration work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry units to Project site strapped together in suitable packs or pallets or in heavy-duty cartons.
- B. Deliver other materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.
- 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 hydrated lime in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.
- E. Store lime putty covered with water in sealed containers.
- F. Store sand where grading and other required characteristics can be maintained and contamination avoided.



1.7 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit masonry restoration and cleaning work to be performed according to manufacturers' written instructions and specified requirements.
- B. Repair masonry units only when air temperature is between 40 and 90 deg F (4 and 32 deg C) and is predicted to remain so for at least 7 days after completion of the Work unless otherwise indicated.
- C. Hot-Weather Requirements: Protect masonry repair when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required to minimize evaporation. Do not apply mortar to substrates with temperatures of 90 deg F (32 deg C) and above unless otherwise indicated.
- D. For manufactured repair materials, perform work within the environmental limits set by each manufacturer.

PART 2 - PRODUCTS

2.1 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II, white where required for color matching of exposed mortar.
 - 1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
- B. Mortar Sand: ASTM C 144 unless otherwise indicated.
 - 1. Color: Provide natural sand of color necessary to produce required mortar color.
 - 2. For pointing mortar, provide sand with rounded edges.
 - 3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
- C. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.
- D. Water: Potable.

2.2 MANUFACTURED REPAIR MATERIALS

- A. Masonry Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching masonry.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- a. Cathedral Stone Products, Inc.; Jahn M100 Terra Cotta and Brick Repair Mortar.
 - b. Conproco Corporation;
 - c. Edison Coatings, Inc.; Custom System 45.
2. Use formulation that is vapor- and water permeable (equal to or more than the masonry unit), exhibits low shrinkage, has lower modulus of elasticity than the masonry units being repaired, and develops high bond strength to all types of masonry.
 3. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.
 4. Formulate patching compound used for patching brick and cast stone in colors and textures to match each masonry unit being patched. Provide sufficient number of colors to enable matching the color, texture, and variation of each unit.

MORTAR MIXES

- B. Preparing Lime Putty: Slake quicklime and prepare lime putty according to appendix to ASTM C 5 and manufacturer's written instructions.
- C. Measurement and Mixing: Measure cementitious materials and sand in a dry condition by volume or equivalent weight. Do not measure by shovel; use known measure. Mix materials in a clean, mechanical batch mixer.
 1. Mixing Pointing Mortar: Thoroughly mix cementitious materials and sand together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix that will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 15 to 30 minutes. Add remaining water in small portions until mortar reaches desired consistency. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
- D. Colored Mortar: Produce mortar of color required by using specified ingredients. Do not alter specified proportions without Architect's approval.
 1. Mortar Pigments: Where mortar pigments are indicated, do not exceed a pigment-to-cement ratio of 1:10 by weight.
- E. Do not use admixtures in mortar unless otherwise indicated.

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, interior finishes, theater seating, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from masonry restoration work.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1. Erect temporary protective covers over finishes, equipment and seating that must remain in service during course of restoration and cleaning work.
 - 2.
- B. Prevent mortar from staining face of surrounding masonry and other surfaces.
1. Cover sills, ledges, and projections to protect from mortar droppings.
 2. Keep wall area wet below rebuilding work to discourage mortar from adhering.
 3. Immediately remove mortar in contact with exposed masonry and other surfaces.
 4. Clean mortar splatters from scaffolding at end of each day.

3.2 MASONRY UNIT PATCHING

- A. Patch the following masonry units unless another type of replacement or repair is indicated:
1. Units with holes.
 2. Units with chipped edges or corners.
 3. Units with small areas of deep deterioration.
- B. Remove and replace existing patches unless otherwise indicated or approved by Architect.

3.3 FIELD QUALITY CONTROL

- A. Architect's Project Representatives: Architect will assign Project representatives to help carry out Architect's responsibilities at the site, including observing progress and quality of portion of the Work completed. Allow Architect's Project representatives use of lift devices and scaffolding, as needed, to observe progress and quality of portion of the Work completed.

END OF SECTION 040120



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



SECTION 04 2000 - UNIT MASONRY- BRICK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 Section Includes:

- 1.2.1.1 Face Brick
- 1.2.1.2 Interior Brick Veneer (at Conference Room 114)
- 1.2.1.3 Mortar and grout.
- 1.2.1.4 Steel reinforcing bars.
- 1.2.1.5 Ties and anchors.
- 1.2.1.6 Embedded flashing.
- 1.2.1.7 Miscellaneous masonry accessories.

1.2.2 Related Sections:

- 1.2.2.1 Division 05 Section "Metal Fabrications" for furnishing steel lintels and shelf angles for unit masonry.

1.3 SUBMITTALS

1.3.1 Product Data: For each type of product indicated.

1.3.2 Samples for Verification: For each type and color of mortar to match existing

1.4 QUALITY ASSURANCE

1.4.1 Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

1.4.2 Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.



1.5 DELIVERY, STORAGE, AND HANDLING

- 1.5.1 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.
- 1.5.2 Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- 1.5.3 Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- 2.1.1 Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.2 BRICK

- 2.2.1 General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

- 2.2.1.1 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.
- 2.2.1.2 Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
- 2.2.1.3 Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

- 2.2.2 Face Brick: Facing brick complying with ASTM C 216 or hollow brick complying with ASTM C 652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area).

- 2.2.2.1 Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- 2.2.2.1.1 As selected by Owner within the \$325 per thousand allowance.
- 2.2.2.2 Grade: SW.
- 2.2.2.3 Type: FBX
- 2.2.2.4 Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 4150 psi
- 2.2.2.5 Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
- 2.2.2.6 **Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."**



- 2.2.2.7 Surface Coating: Brick with colors or textures produced by application of coatings shall withstand 50 cycles of freezing and thawing per ASTM C 67 with no observable difference in the applied finish when viewed from 10 feet or shall have a history of successful use in Project's area.
- 2.2.2.8 Size (Actual Dimensions): 3-5/8 inches wide by 2-13/16 inches high by 7-5/8 inches long. Three units with grout bed should equal 8" in height.
- 2.2.2.9 Application: Use where brick is exposed unless otherwise indicated.
- 2.2.2.10 Color and Texture: Match Existing from manufacturer's FULL LINE.**

2.3 Interior Brick Veneer-

2.3.1 Interior Brick Veneer at the Conference Room 114 is to be selected by the Architect from the Georgia Classic Collection of Cherokee Brick. Brick veneer may be 1" pre-manufactured veneer or field cut from solid, standard units. Only the factory edge may be visible in the final installation.

2.4 MORTAR AND GROUT MATERIALS

2.4.1 Aggregate for Grout: ASTM C 404.

2.4.2 Water: Potable.

2.4.3 Color- Match Existing

2.5 TIES AND ANCHORS

2.5.1 Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.

2.5.1.1 Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.

2.5.2 Adjustable Masonry-Veneer Anchors:

2.5.2.1 Contractor's Option: Unless otherwise indicated

2.5.3 Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

2.6 EMBEDDED FLASHING MATERIALS

2.6.1 Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

2.6.1.1.1 Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- 2.6.1.1.1 Cheney Flashing Company; Cheney Flashing (Dovetail) or Cheney 3-Way Flashing (Sawtooth).
- 2.6.1.1.2 Keystone Flashing Company, Inc.; Keystone 3-Way Interlocking Thruwall Flashing.
- 2.6.1.1.3 Sandell Manufacturing Co., Inc.; Mechanically Keyed Flashing.
- 2.6.1.2 Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
- 2.6.1.3 Metal Drip Edge: Fabricate 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.
- 2.6.2 Application: Unless otherwise indicated, use the following:
 - 2.6.2.1 Where flashing is indicated to receive counterflashing, use metal flashing.
 - 2.6.2.2 Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
 - 2.6.2.3 Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge with a sealant stop or flexible flashing with a metal drip edge or elastomeric thermoplastic flashing with drip edge or flexible flashing with a metal sealant stop.
 - 2.6.2.4 Where flashing is fully concealed, use metal flashing or flexible flashing.

2.7 MORTAR AND GROUT MIXES

- 2.7.1 General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
- 2.7.2 Grout for Unit Masonry: Comply with ASTM C 476.
 - 2.7.2.1 Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2.7.2.2 Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
 - 2.7.2.3 Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- 3.1.1 Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 3.1.1.1 Verify that foundations are within tolerances specified.
 - 3.1.1.2 Verify that reinforcing dowels are properly placed.

3.1.2 Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

3.2.1 Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

3.2.2 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.

3.2.3 Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

3.3 TOLERANCES

3.3.1 Dimensions and Locations of Elements:

3.3.1.1 For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.

3.3.1.2 For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.

3.3.1.3 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.

3.3.2 Lines and Levels:

3.3.2.1 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.

3.3.2.2 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.

3.3.2.3 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.

3.3.2.4 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.

3.3.2.5 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.

3.3.2.6 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.

3.3.3 Joints:

- 3.3.3.1 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.
- 3.3.3.2 For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
- 3.3.3.3 For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
- 3.3.3.4 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.
- 3.3.3.5 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 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

3.4.1 Install flashing as follows unless otherwise indicated:

- 3.4.1.1 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 as recommended by flashing manufacturer.
- 3.4.1.2 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.
- 3.4.1.3 Install metal drip edges 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 drip edge.

3.5 REPAIRING, POINTING, AND CLEANING

- 3.5.1 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.
- 3.5.2 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.

3.6 MASONRY WASTE DISPOSAL

- 3.6.1 Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- 3.6.2 Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 2000



SECTION 04 2001 - UNIT MASONRY- CMU

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 Section Includes:

- 1.2.1.1 Masonry Lintels
- 1.2.1.2 Mortar and grout.
- 1.2.1.3 Steel reinforcing bars.
- 1.2.1.4 Ties and anchors.
- 1.2.1.5 Embedded flashing.
- 1.2.1.6 Miscellaneous masonry accessories.

1.3 DEFINITIONS

1.3.1 CMU(s): Concrete masonry unit(s).

1.3.2 Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

1.4.1 Provide unit masonry that develops indicated net-area compressive strengths at 28 days.

1.4.1.1 Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.5 SUBMITTALS

1.5.1 Product Data: For each type of product indicated.

1.5.2 Samples for Verification: For each type and color of mortar to match existing



1.6 QUALITY ASSURANCE

1.6.1 Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

1.7.1 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.

1.7.2 Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.7.3 Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

1.7.4 Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

1.7.5 Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

2.1.1 Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.1.2 Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 MASONRY LINTELS

2.2.1 Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs 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.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

2.3 MORTAR AND GROUT MATERIALS

2.3.1 Regional Materials: Provide aggregate for mortar and grout that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.3.2 Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

2.3.3 Aggregate for Mortar: ASTM C 144.

2.3.3.1 For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.

2.3.3.2 For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

2.3.3.3 Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

2.3.4 Aggregate for Grout: ASTM C 404.

2.3.5 Refractory Mortar Mix: Ground fireclay or non-water-soluble, calcium aluminate, medium-duty refractory mortar that passes ASTM C 199 test; or an equivalent product acceptable to authorities having jurisdiction.

2.3.6 Water: Potable.

2.4 REINFORCEMENT

2.4.1 Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

2.4.2 Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

2.5 TIES AND ANCHORS

2.5.1 Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.

2.5.1.1 Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.

2.5.2 Adjustable Masonry-Veneer Anchors:

2.5.2.1 Contractor's Option: Unless otherwise indicated

2.5.2.2

2.5.2.3 MISCELLANEOUS ANCHORS

2.5.3 Anchor Bolts: Headed or L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

2.6 EMBEDDED FLASHING MATERIALS

2.6.1 Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:

2.6.1.1.1 Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

2.6.1.1.1.1 Cheney Flashing Company; Cheney Flashing (Dovetail) or Cheney 3-Way Flashing (Sawtooth).

2.6.1.1.1.2 Keystone Flashing Company, Inc.; Keystone 3-Way Interlocking Thruwall Flashing.

2.6.1.1.1.3 Sandell Manufacturing Co., Inc.; Mechanically Keyed Flashing.

2.6.1.2 Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.

2.6.1.3 Metal Drip Edge: Fabricate 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.

2.6.2 Application: Unless otherwise indicated, use the following:

2.6.2.1 Where flashing is indicated to receive counterflashing, use metal flashing.

2.6.2.2 Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.

2.6.2.3 Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge with a sealant stop or flexible flashing with a metal drip edge or elastomeric thermoplastic flashing with drip edge or flexible flashing with a metal sealant stop.

2.6.2.4 Where flashing is fully concealed, use metal flashing or flexible flashing.

2.7 MORTAR AND GROUT MIXES

2.7.1 General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

2.7.1.1 Use Portland cement-lime masonry cement or mortar cement mortar unless otherwise indicated.

2.7.2 Grout for Unit Masonry: Comply with ASTM C 476.

2.7.2.1 Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.

2.7.2.2 Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.



- 2.7.2.3 Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- 3.1.1 Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- 3.1.1.1 Verify that foundations are within tolerances specified.
- 3.1.1.2 Verify that reinforcing dowels are properly placed.
- 3.1.2 Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- 3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- 3.2.1 Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- 3.2.2 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.
- 3.2.3 Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

3.3 TOLERANCES

- 3.3.1 Dimensions and Locations of Elements:
- 3.3.1.1 For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
- 3.3.1.2 For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
- 3.3.1.3 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.
- 3.3.2 Lines and Levels:
- 3.3.2.1 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.

- 3.3.2.2 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.
- 3.3.2.3 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.
- 3.3.2.4 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.
- 3.3.2.5 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.
- 3.3.2.6 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.

3.3.3 Joints:

- 3.3.3.1 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.
- 3.3.3.2 For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
- 3.3.3.3 For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
- 3.3.3.4 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.
- 3.3.3.5 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

- 3.4.1 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.
- 3.4.2 Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- 3.4.3 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.
- 3.4.4 Stopping and Resuming Work: Stop work by racking 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.
- 3.4.5 Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

3.4.6 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.

3.4.7 Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

3.4.7.1 Install compressible filler in joint between top of partition and underside of structure above.

3.4.7.2 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.

3.5 MORTAR BEDDING AND JOINTING

3.5.1 Lay hollow CMUs as follows:

3.5.1.1 With face shells fully bedded in mortar and with head joints of depth equal to bed joints.

3.5.1.2 With webs fully bedded in mortar in all courses of piers, columns, and pilasters.

3.5.1.3 With webs fully bedded in mortar in grouted masonry, including starting course on footings.

3.5.1.4 With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

3.5.1.5 Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.

3.5.1.6 Wet joint surfaces thoroughly before applying mortar.

3.5.2 Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 MASONRY JOINT REINFORCEMENT

3.6.1 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.

3.6.1.1 Space reinforcement not more than 16 inches o.c.

3.6.2 Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

3.6.3 Provide continuity at corners by using prefabricated L-shaped units.

3.6.4 Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 LINTELS

3.7.1 Provide 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.

3.7.2 Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.8 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

3.8.1 Install flashing as follows unless otherwise indicated:

3.8.1.1 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 as recommended by flashing manufacturer.

3.8.1.2 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.

3.8.1.3 Install metal drip edges 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 drip edge.

3.8.2 Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

3.9 FIELD QUALITY CONTROL

3.9.1 Inspections: Level 1 special inspections according to the "International Building Code."

3.9.1.1 Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

3.10 REPAIRING, POINTING, AND CLEANING

3.10.1 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.

3.10.2 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.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

3.11 MASONRY WASTE DISPOSAL

3.11.1 Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

3.11.2 Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04 2001



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



SECTION 04 7200 - UNIT MASONRY- CAST STONE

Part 1 General

1.1. Section Includes - Architectural Cast Stone.

Scope - Cast Stone shown on architectural drawings and as described in this specification.

- Manufacturer shall furnish Cast Stone covered by this specification.

1.2. Related Sections

Section – 01 33 00 – Submittal Procedures.

Section – 04 05 13 – Masonry Mortaring.

Section – 04 05 16 – Masonry Grouting.

Section – 04 05 19 – Masonry Anchorage and Reinforcing.

Section – 04 20 20 – Unit Masonry.

Section – 07 90 00 – Joint Protection.

1.3. References

ACI 318 – Building Code Requirements for Reinforced Concrete.

ASTM A615/A615M – Standard Specification for Deformed and Plain Billet-Steel Bars for Reinforced Concrete.

ASTM A1064 / A1064M – Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

ASTM C33 – Standard Specification for Concrete Aggregates.

ASTM C150 - Standard Specification for Portland Cement.

ASTM C595 – Blended Cement

ASTM C1157 – Hydraulic Cement

ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volume Method.

ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

ASTM C260 - Standard Specification for Air-Entrained Admixtures for Concrete.

ASTM C270 - Standard Specification for Mortar for Unit Masonry.

ASTM C426 – Standard Test Method for Linear Shrinkage of Concrete Masonry Units.

ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.

ASTM C618 – Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

ASTM C666/666M – Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

ASTM C979 - Standard Specification for Coloring Pigments for Integrally Colored Concrete.

ASTM C989 – Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete.

ASTM C1116 – Standard Specification for Fiber Reinforced Concrete and Shotcrete.

ASTM C1194 - Standard Test Method for Compressive Strength of Architectural Cast Stone.

ASTM C1195 - Standard Test Method for Absorption of Architectural Cast Stone.

ASTM C1364 - Standard Specification for Architectural Cast Stone.

ASTM D2244 – Standard Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.

ASTM D7957/D7957M – Standard Specification for Solid Round Glass Fiber Reinforced Polymer Bars for Concrete Reinforcement.

Cast Stone Institute® Technical Manual (Current Edition)

TMS 404-504-604- Standards for Architectural Cast Stone Design – Fabrication - Installation

▲ **top**

1.4. Definitions

Cast Stone - a refined architectural concrete building unit manufactured to simulate natural cut stone, used in Division 4 masonry applications.

- Dry Cast – manufactured from zero slump concrete.

Vibrant Dry Tamp (VDT) casting method: Vibratory ramming of earth moist, zero-slump concrete against a rigid mold until it is densely compacted.

Machine casting method: Manufactured from earth moist, zero-slump concrete compacted by machinery using vibration and pressure against a mold until it becomes densely consolidated.

- Wet Cast – Manufactured from measurable slump concrete.



Wet casting method: Manufactured from measurable slump concrete and vibrated into a mold until it becomes densely consolidated.

- Specifier Note: Slump, manufacturing method, and apparatus shall be selected by the manufacturer and not specified by the purchaser.

1.5. Submittal Procedures

Comply with Section 01 33 00 – Submittal Procedures.

Samples: Submit pieces of the Cast Stone that are representative of the general range of finish and color proposed to be furnished for the project.

Test results: Submit manufacturers test results of Cast Stone previously made by the manufacturer.

Shop Drawings: Submit manufacturers shop drawings including profiles, cross-sections, reinforcement, exposed faces, arrangement of joints (optional for standard or semi-custom installations), anchoring methods, anchors (if required), annotation of stone types and their location.

Warranty: Submit Cast Stone Institute® Member Limited Warranty.

Certification: Submit valid Cast Stone Institute® Plant Certification.

1.6. Quality Assurance

Manufacturer Qualifications:

- Cast Stone shall be produced in a plant certified by the Cast Stone Institute®.
- Manufacturer shall have sufficient plant facilities to produce the shapes, quantities and size of Cast Stone required in accordance with the project schedule.
- Manufacturer shall submit a written list of projects similar in scope and at least three (3) years of age, along with owner, architect and contractor references.

Standards: Comply with the requirements of the Cast Stone Institute® Technical Manual and the project specifications. Where a conflict may occur, the contract documents shall prevail.

Mock-up (Optional) Provide full size unit(s) for use in construction of sample wall. The approved mock-up shall become the standard for appearance and workmanship for the project.

Warranty Period: 10 years.

▲ **top**

Part 2 Products



2.1. Architectural Cast Stone

Comply with current version ASTM C1364

Physical properties: Provide the following:

- Compressive Strength - ASTM C1194: 6,500 psi minimum at 28 days.
- Absorption – ASTM C1195: 6.0% maximum at 28 days.
- Air Content – Provide sufficient air content to meet the freeze-thaw requirements for wet cast products, when the air content is tested in accordance with Test Method C173/C173M or Test Method C231/C231M. Air entrainment is not required for Vibrant Dry Tamp (VDT) products.
- Freeze-thaw – ASTM C666/C666M in accordance with ASTM C1364. The CPWL shall be less than 5.0% after 300 cycles of freezing and thawing.
- Linear Drying Shrinkage – ASTM C426: Test and report in accordance with ASTM C1364.

Job site testing – One sample from production units may be selected at random from the field for each 500 cubic feet (14 m³) delivered to the job site.

- Three field cut cube specimens from each of these samples shall have an average minimum compressive strength of not less than 85% with no single specimen testing less than 75% of design strength as allowed by ACI 318.
- Three field cut cube specimens from each of these samples shall have an average maximum cold-water absorption of 6.0%.
- Field specimens shall be tested in accordance with ASTM C1194 and C1195.

2.2. Raw Materials

Portland cement – Type I or Type III, white and/or grey, ASTM C150.

Coarse aggregates - Granite, quartz or limestone, ASTM C33, except for gradation, and are optional for the Vibrant Dry Tamp (VDT) casting method.

Fine aggregates - Manufactured or natural sands, ASTM C33, except for gradation.

Colors - Inorganic iron oxide pigments, ASTM C979 except that carbon black pigments shall not be used.

Admixtures- Comply with the following:

- ASTM C260 for air-entraining admixtures.
- ASTM C494/C495M Types A - G for water reducing, retarding, accelerating and high range admixtures.

- Other admixtures: Integral water repellents and other chemicals, for which no ASTM Standard exists, shall be previously established as suitable for use in concrete by proven field performance or through laboratory testing.
- ASTM C618 mineral admixtures of dark and variable colors shall not be used in surfaces intended to be exposed to view.
- ASTM C989 granulated blast furnace slag may be used to improve physical properties. Tests are required to verify these feature.

Water – Potable

Reinforcing bars:

- ASTM A615/A615M: Grade 40 or 60 steel galvanized or epoxy coated when cover is less than 1.5 in.
- ASTM D7957/D7957M: Standard Specification for Solid Round Glass Fiber Reinforced Polymer Bars for Concrete Reinforcement.
- Welded Wire Fabric: ASTM A1064 / A1064M where applicable for wet cast units.

Fiber reinforcement (optional): ASTM C1116

All anchors, dowels and other anchoring devices and shims shall be standard building stone anchors commercially available in a non-corrosive material such as zinc plated, galvanized steel, brass, or stainless steel Type 302 or 304.

▲ **top**

2.3. Color And Finish

Match sample on file in architect's office.

All surfaces intended to be exposed to view shall have a fine-grained texture similar to natural stone, with no air voids in excess of 1/32 in. and the density of such voids shall be less than 3 occurrences per any 1 in.² and not obvious under direct daylight illumination at a 5 ft distance.

Units shall exhibit a texture approximately equal to the approved sample when viewed under direct daylight illumination at a 10 ft distance.

- ASTM D2244 permissible variation in color between units of comparable age subjected to similar weathering exposure.
 - Total color difference – not greater than 6 units.
 - Total hue difference – not greater than 2 units.

Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under direct daylight illumination from a 20-ft distance.

The occurrence of crazing or efflorescence shall not constitute a cause for rejection.



Remove cement film, if required, from exposed surfaces prior to packaging for shipment.

2.4. Reinforcing

Reinforce the units as required by the drawings and for safe handling and structural stress.

Minimum reinforcing shall be 0.25 percent of the cross section area.

Reinforcement shall be noncorrosive where faces exposed to weather are covered with less than 1.5 in. of concrete material. All reinforcement shall have minimum coverage of twice the diameter of the bars.

Panels, soffits and similar stones greater than 24 in. (600 mm) in one direction shall be reinforced in that direction. Units less than 24 in. (600 mm) in both their length and width dimension shall be non-reinforced unless otherwise specified.

Welded wire fabric reinforcing shall not be used in dry cast products.

2.5. Curing

Cure units in a warm curing chamber approximately 100°F (37.8°C) at 95 percent relative humidity for approximately 12 hours, or cure in a 95 percent moist environment at a minimum 70°F (21.1°C) for 16 hours after casting. Additional yard curing at 95 percent relative humidity shall be 350 degree-days (i.e. 7 days @ 50°F (10°C) or 5 days @ 70°F (21°C) prior to shipping. Form cured units shall be protected from moisture evaporation with curing blankets or curing compounds after casting.

[▲ top](#)

2.6. Manufacturing Tolerances

Cross section dimensions shall not deviate by more than $\pm 1/8$ in. from approved dimensions.

Length of units shall not deviate by more than length/ 360 or $\pm 1/8$ in., whichever is greater, not to exceed $\pm 1/4$ in.

Maximum length of any unit shall not exceed 15 times the average thickness of such unit unless otherwise agreed by the manufacturer.

Warp, bow or twist of units shall not exceed length/ 360 or $\pm 1/8$ in., whichever is greater.

Location of dowel holes, anchor slots, flashing grooves, false joints and similar features – On formed sides of unit, 1/8 in., on unformed sides of unit, 3/8 in. maximum deviation.

2.7. Production Quality Control

Testing.

- Test compressive strength and absorption from specimens taken from every 500 cubic feet of product produced.
- Perform tests in accordance ASTM C1194 and C1195.
- Have tests performed by an independent testing laboratory every six months.
- New and existing mix designs shall be tested for strength and absorption compliance prior to producing units.
- Retain copies of all test reports for a minimum of two years.

2.8. Delivery, Storage And Handling

Mark production units with the identification marks as shown on the shop drawings.

Package units and protect them from staining or damage during shipping and storage.

Provide an itemized list of product to support the bill of lading.

3. Part 3 Execution

▲ top

3.1. Examination

Installing contractor shall check Cast Stone materials for fit and finish prior to installation.

Unacceptable units shall not be set.

3.2. Setting Tolerances

Comply with Cast Stone Institute® Technical Manual.

Set stones 1/8 in. or less, within the plane of adjacent units.

Joints, plus - 1/16 in., minus - 1/8 in.

3.3. Jointing

Joint size:

- At stone/brick joints 3/8 in.
- At stone/stone joints in vertical position 1/4 in. (3/8 in. optional).
- Stone/stone joints exposed on top 3/8 in.

Joint materials:



- Mortar, Type N, ASTM C270.
- Use a full bed of mortar at all bed joints.
- Flush vertical joints full with mortar.
- Leave all joints with exposed tops or under relieving angles open for sealant.
- Leave head joints in copings and projecting components open for sealant.

Location of joints:

- As shown on shop drawings.
- At control and expansion joints unless otherwise shown.

3.4. Setting

Wet units with clean water prior to setting.

Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

Set units in full bed of mortar, unless otherwise detailed.

Rake mortar joints 3/4 in. in for pointing.

Remove excess mortar from unit faces immediately after setting.

Tuck point unit joints to a slight concave profile.

3.5. Joint Protection

Comply with requirements of Section 07 90 00.

Prime ends of units, insert properly sized backing rod and install required sealant.

3.6. Repair and Cleaning

Repair chips with touchup materials furnished by manufacturer.

Saturate units to be cleaned prior to applying an approved masonry cleaner.

Consult with manufacturer for appropriate cleaners. [top](#)

3.7. Inspection and Acceptance

Inspect finished installation according to Cast Stone Institute® Technical Bulletin #36.

Do not field apply water repellent until repair, cleaning, inspection and acceptance is completed.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

3.8. WATER REPELLENT (Optional)

Apply water repellent in accordance with Cast Stone Institute® Technical Bulletin #35 or water repellent manufacturer's directions.

- **End Of Section**



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



SECTION 055213 - PIPE AND TUBE RAILINGS

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 tube railings.

1.3 PERFORMANCE REQUIREMENTS

- A. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:

- 1. Steel: 72 percent of minimum yield strength.

- B. Structural Performance: Railings shall 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.

- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications 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.

- D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1.4 SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of railing to concrete slab connection.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Welding certificates.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

1.7 COORDINATION AND SCHEDULING

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. 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 such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.



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. Steel Tube Railings:
 - a. Pisor Industries, Inc.
 - b. Wagner, R & B, Inc.; a division of the Wagner Companies.

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, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.3 STEEL AND IRON

- A. Tubing: ASTM A 500 (cold formed).
- B. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.4 FASTENERS

- A. General: Provide the following:
1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 for zinc coating.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. 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 E 488, conducted by a qualified independent testing agency.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy [Group 1] [Group 2] stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.5 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- B. Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.
 1. Products: Subject to compliance with requirements
- C. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.
 1. Products: Subject to compliance with requirements
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 1. Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.6 FABRICATION

- A. General: 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. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.

- E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Connections: Fabricate railings with welded connections unless otherwise indicated.
- G. 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 surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- H. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- I. Close exposed ends of railing members with prefabricated end fittings.
- J. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- K. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
- L. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- M. For railing posts set in concrete, provide 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.

2.7 STEEL FINISHES

- A. For nongalvanized steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 1. Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

- C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
1. Shop prime uncoated railings with universal shop primer
 2. Do not apply primer to galvanized surfaces.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 3. 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
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 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.
- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.3 ANCHORING POSTS



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- A. Use metal sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material

3.4 ATTACHING RAILINGS

- A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends
- C. Attach railings to wall with wall brackets, except where end flanges are used. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- D. Secure wall brackets and railing end flanges to building construction as follows:
 - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.

3.5 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

3.6 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.

END OF SECTION 055213



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



SECTION 061000 - ROUGH CARPENTRY

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. Wood blocking, cants, and nailers.
- 2. Wood sleepers.
- 3. Plywood backing panels and roof replacement sheathing.

1.3 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- C. Timber: Lumber of 5 inches nominal or greater in least dimension.
- D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NLGA: National Lumber Grades Authority.
 - 3. RIS: Redwood Inspection Service.
 - 4. SPIB: The Southern Pine Inspection Bureau.
 - 5. WCLIB: West Coast Lumber Inspection Bureau.
 - 6. WWPA: Western Wood Products Association.

1.4 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.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber 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, GENERAL

- A. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
 1. Dimension lumber framing.
 2. Miscellaneous lumber.
- B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded 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.
- C. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, no limit for more than 2-inch nominal thickness unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2
 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
 - C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
 - D. Application: Treat all rough carpentry unless otherwise indicated, items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
- 2.3 FIRE-RETARDANT-TREATED MATERIALS (Backing Panels and Roofing Replacement Sheathing)
- 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 Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, 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 shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841. For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.
 - C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
 - D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
 - E. Application: Treat items indicated on Drawings, and the following:



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1. Roof construction.
2. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
 2. Nailers.
 3. Cants.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.
- C. 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.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- E. 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: DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
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 A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- F. Bolts: Steel bolts complying with ASTM A 307, Grade A with ASTM A 563 hex nuts and, where indicated, flat washers.

2.7 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Cleveland Steel Specialty Co.
2. KC Metals Products, Inc.
3. Phoenix Metal Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. USP Structural Connectors.

- C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

- D. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.
- 2.

- E. Joist Ties as needed for additional support at openings and damaged portions of roof: Flat straps, with holes for fasteners, for tying joists together over supports.

1. Width: 1-1/4 inches
2. Thickness: 0.062 inch
3. Length: 24 inches

2.8 MISCELLANEOUS MATERIALS

- A. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

- B. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1. Adhesives shall have a VOC content of **70g/L** or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- 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. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
- H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal- thickness.
 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.

- I. Sort and select lumber so that natural characteristics will 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.
- J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
- K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

- 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 items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- 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 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000



Renovations and Additions North Main Annex

April 27, 2022
Bid Set

SECTION 06 1600 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- 1.2.1 This Section includes the following:

- 1.2.1.1 Combination roof sheathing/roof underlayment.
- 1.2.1.2 Combination wall sheathing/water-resistive barrier.
- 1.2.1.3 Flexible flashing at openings in sheathing.

- 1.2.2 Related Sections include the following:

- 1.2.2.1 Division 06 Section "Rough Carpentry" for plywood backing panels.

1.3 SUBMITTALS

- 1.3.1 Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

- 1.3.1.1 For panels with integral water resistive barrier, include data on air-/moisture-infiltration protection based on testing according to referenced standards.

- 1.3.2 Research/Evaluation Reports: For sheathing system, from International Code Council (ICC), ICC-ESR1785 International Code Council (ICC), ICC-ESR1473 International Code Council (ICC), ICC-ESR1474 International Code Council (ICC), ICC-ESR2227. For the following, showing compliance with building code in effect for Project:

- 1.3.2.1 Preservative-treated plywood.
- 1.3.2.2 Fire-retardant-treated plywood.
- 1.3.2.3 Roof sheathing/roof underlayment.
- 1.3.2.4 Wall sheathing/water-resistive barrier.

1.4 QUALITY ASSURANCE

- 1.4.1 Manufacturer Qualifications: Capable of demonstrating that all wood procurement operations are conducted in accordance with procedures and policies of the Sustainable Forestry Initiative (SFI) Program.

- 1.4.2 Code Compliance: Comply with requirements of the following:

- 1.4.2.1 International Code Council (ICC), ICC-ESR1785.



Renovations and Additions North Main Annex

April 27, 2022
Bid Set

- 1.4.2.2 International Code Council (ICC), ICC-ESR1473.
- 1.4.2.3 International Code Council (ICC), ICC-ESR1474 .
- 1.4.2.4 International Code Council (ICC), ICC-ESR2227.

1.4.3 Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

- 1.4.3.1 Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory."
- 1.4.3.2 Oriented strand board.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Outdoor Storage: Comply with manufacturer's recommendations.

- 1.5.1.1 Set panel bundles on supports to keep off the ground.
- 1.5.1.2 Cover panels loosely with waterproof protective material.
- 1.5.1.3 Anchor covers on top of stack, but keep away from sides and bottom to assure adequate air circulation.
- 1.5.1.4 When high moisture conditions exist, cut banding on panel stack to prevent edge damage.

1.6 WARRANTY

1.6.1 Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of sheathing system that fail due to manufacturing defects within specified warranty period.

- 1.6.1.1 Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

2.1.1 Oriented Strand Board: DOC PS 2.

2.1.2 Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

2.1.3 Factory mark panels to indicate compliance with applicable standard.

2.2 COMBINATION WALL SHEATHING/WATER-RESISTIVE BARRIER

2.2.1 Oriented-Strand-Board Wall Sheathing: With integral water-resistive barrier, Exposure 1 sheathing.

- 2.2.1.1 Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; ZIP System Wall Sheathing or a comparable product by one of the following:
 - 2.2.1.1.1 Georgia Pacific- Nautilus Sheathing System
- 2.2.1.2 Span Rating: Not less than 24/16.
- 2.2.1.3 Nominal Thickness: Not less than 7/16 inch
- 2.2.1.4 Edge Profile: Self-spacing profile.
- 2.2.1.5 Provide fastening guide on top panel surface with pre-spaced fastening symbols for 16-inches and 24-inches on centers spacings.
- 2.2.1.6 Performance Standard: PS2.
- 2.2.1.7 Integral Water-Resistive Barrier: Medium-density phenolic-impregnated kraft paper overlay.
- 2.2.1.8 Perm Rating of Integral Water-Resistive Barrier: 12-16 perms.
- 2.2.1.9 Perm Rating of OSB Substrate in Combination with Integral Water-Resistive Barrier: 2-3 perms.

2.3 COMBINATION ROOF SHEATHING/ROOF UNDERLAYMENT

- 2.3.1 Oriented-Strand-Board Roof Sheathing: With integral water-resistive barrier, Exposure 1, Structural I sheathing.
 - 2.3.1.1 Basis-of-Design Product: Subject to compliance with requirements, provide Huber Engineered Woods LLC; ZIP System Roof Sheathing or a comparable product by one of the following:
 - 2.3.1.1.1 Georgia Pacific- Nautilus Sheathing System
 - 2.3.1.2 Span Rating: Not less than 40/20.
 - 2.3.1.3 Nominal Thickness: Not less than 5/8 inch.
 - 2.3.1.4 Edge Profile: Tongue and groove.
 - 2.3.1.5 Provide fastening guide on top panel surface with pre-spaced fastening symbols for 16-inches and 24-inches on centers spacings.
 - 2.3.1.6 Performance Standard: PS2.
 - 2.3.1.7 Integral Roofing Underlayment: Medium-density phenolic-impregnated kraft paper overlay.

2.4 FASTENERS

- 2.4.1 General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 2.4.1.1 For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- 2.4.2 Nails: Ring shank, ASTM F 1667.
- 2.4.3 Power-Driven Fasteners: NES NER-272.
- 2.4.4 Wood Screws: Hardened, ASME B18.6.1.



Renovations and Additions North Main Annex

April 27, 2022

Bid Set

2.5 MISCELLANEOUS MATERIALS

2.5.1 Adhesives for Field Gluing Subfloor Panels to Framing: Solvent-based formulation complying with AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

2.5.1.1 Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.5.2 Flexible Flashing: Pressure-sensitive, self-adhering, cold-applied, proprietary seam tape consisting of polyolefin film with acrylic adhesive, designed for use around wood, steel, and vinyl-framed flanged windows, frames, door frames and wall penetrations.

2.5.2.1 Basis-of-Design Product: Subject to compliance with requirements provide Huber Engineered Woods; ZIP System Tape or a comparable product by one of the following:

2.5.2.1.1 Georgia Pacific- Nautilus Sheathing System

2.5.2.2 Thickness: 0.012 inch

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

3.1.1 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.

3.1.2 Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

3.1.3 Securely attach to substrate by fastening as indicated, complying with the following:

3.1.3.1 NES NER-272 for power-driven fasteners.

3.1.3.2 Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

3.1.4 Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

3.1.5 Coordinate wall and roof 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.

3.1.6 Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.1.7 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.



Renovations and Additions North Main Annex

April 27, 2022

Bid Set

3.2 WOOD STRUCTURAL PANEL INSTALLATION

3.2.1 General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

3.2.2 Fastening Methods: Fasten panels as indicated below:

3.2.2.1 Wall and Roof Sheathing:

3.2.2.1.1 Nail to wood framing.

3.2.2.1.2 Space panels 1/8 inch apart at edges and ends, unless tongue and groove is used.

3.2.2.1.3 Install fasteners 3/8 inch/2 inchSin compliance with requirements of authority having jurisdiction.

3.3 SHEATHING JOINT-AND-PENETRATION TREATMENT

3.3.1 Seal sheathing joints according to sheathing manufacturer's written instructions.

3.3.1.1 Apply proprietary seam tape to joints between sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

3.4 FLEXIBLE FLASHING INSTALLATION

3.4.1 Apply flexible flashing where indicated to comply with manufacturers written instructions.

3.4.1.1 After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.

END OF SECTION 06 1600



**Renovations and Additions
North Main Annex**

**April 27, 2022
Bid Set**



**Renovations and Additions
North Main Annex**

**April 27, 2022
Bid Set**

SECTION 06 2013 - EXTERIOR FINISH CARPENTRY (Wood Mouldings)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 This Section includes the following:

1.2.1.1 Exterior standing and running trim. **Architectural Mouldings**

1.2.2 Related Sections include the following:

1.2.2.1 Division 06 Section "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view and for structural wood decking and framing exposed to view.

1.3 DEFINITIONS

1.3.1 Lumber grading agencies, and the abbreviations used to reference them, include the following:

1.3.1.1 NLGA: National Lumber Grades Authority.

1.3.1.2 SPIB: The Southern Pine Inspection Bureau.

1.4 SUBMITTALS

1.4.1 Samples for Initial Selection: **For each type of moulding indicated. Profiles to match existing.**

1.4.2 Compliance Certificates:

1.4.2.1 For lumber that is not marked with grade stamp.

1.4.2.2 For preservative-treated wood that is not marked with treatment quality mark.

1.4.2.3 For fire-retardant-treated wood that is not marked with classification marking of testing and inspecting agency.

1.4.3 Warranties: Special warranties specified in this Section.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Protect materials against weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation within and around stacks and under temporary coverings.

1.6 PROJECT CONDITIONS

1.6.1 Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

1.6.2 Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1.6.2.1 Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

1.6.2.2 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

2.1.1 Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.

2.1.1.1 Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.

2.1.2 Softwood Plywood: DOC PS 1.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

2.2.1 Water-Repellent Preservative Treatment by Nonpressure Process: AWPA N1 (dip, spray, flood, or vacuum-pressure treatment).

2.2.1.1 Preservative Chemicals: 3-iodo-2-propynyl butyl carbamate (IPBC), combined with an insecticide containing chlorpyrifos (CPF).

- 2.2.1.2 Use chemical formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated material from untreated material.
- 2.2.1.3 Application: Items not required to be pressure-preservative treated.

2.2.2 Preservative Treatment by Pressure Process:

- 2.2.2.1 Lumber: AWWA C2 except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWWA C31 with inorganic boron (SBX). Kiln dry after treatment to a maximum moisture content of 19 percent.
- 2.2.2.2 Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- 2.2.2.3 For exposed items indicated to receive transparent finish, do not use chemical formulations that contain colorants or that bleed through or otherwise adversely affect finishes.
- 2.2.2.4 Do not use material that is warped or does not comply with requirements for untreated material.
- 2.2.2.5 Mark lumber with treatment quality mark of an inspection agency approved by ALSC's Board of Review.

2.3 STANDING AND RUNNING TRIM

2.3.1 Lumber Trim for Unfinished Applications:

- 2.3.1.1 Species and Grade: No. 2 Grade Cypress
- 2.3.1.2 Maximum Moisture Content: 19 percent with at least 85 percent of shipment at 12 percent or less.
- 2.3.1.3 Finger Jointing: Not allowed.
- 2.3.1.4 Face Surface: Saw textured.
- 2.3.1.5 Size as indicated on drawings. Use 1 inch by 4 inch nominal trim around siding and openings where not indicated otherwise.

2.3.2 Moldings for Unfinished Applications: WMMPA WM 4, N-grade wood moldings, without finger jointing. Made from kiln-dried stock to patterns included in WMMPA WM 12.

- 2.3.2.1 Species: No. 2 Grade Cypress.
- 2.3.2.2 Size as indicated on Drawings. Use 1 inch by 4 inch nominal trim around siding where not indicated as otherwise. In addition provide 1 inch by 4 inch nominal trim around all exterior doors and windows.

2.4 MISCELLANEOUS MATERIALS

2.4.1 Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches into wood substrate.

2.4.1.1 For pressure-preservative-treated wood, provide stainless-steel fasteners.

2.4.1.2 For applications not otherwise indicated, provide stainless-steel fasteners.

2.4.2 Flashing: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.

2.4.2.1 Horizontal Joint Flashing for Siding: Preformed, aluminum or stainless-steel, Z-shaped flashing.

2.4.2.2 Net Free Area: 4 sq. in./linear ft..

2.4.2.3 Finish: Mill finish.

2.4.3 Sealants: Latex, complying with ASTM C 834, Type P, Grade NF and with applicable requirements in Division 07 Section "Joint Sealants," recommended by sealant manufacturer and manufacturer of substrates for intended application. Color to be selected by Architect prior to installation.

2.4.3.1 Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

2.4.3.1.1 Bostik Findley; Chem-Calk 600.

2.4.3.1.2 Pecora Corporation; AC-20+.

2.4.3.1.3 Schnee-Morehead, Inc.; SM 8200.

2.4.3.1.4 Sonneborn, Division of ChemRex Inc.; Sonolac.

2.4.3.1.5 Tremco; Tremflex 834.

2.5 FABRICATION

2.5.1 Back out or kerf backs of standing and running trim wider than 5 inches, except members with ends exposed in finished work.

2.5.2 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

- 3.1.1 Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- 3.1.2 Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- 3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- 3.2.1 Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION, GENERAL

- 3.3.1 Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
 - 3.3.1.1 Do not use manufactured units with defective surfaces, sizes, or patterns.
- 3.3.2 Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 3.3.2.1 Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 3.3.2.2 Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining exterior finish carpentry with 1/32-inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.
 - 3.3.2.3 Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.

3.4 ARCHITECTURAL MOULDING INSTALLATION

- 3.4.1 Profiles and depths to match adjacent existing moulding and trim.**



**Renovations and Additions
North Main Annex**

**April 27, 2022
Bid Set**

3.5 ADJUSTING

3.5.1 Replace exterior finish carpentry that is damaged or does not comply with requirements. Exterior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.6 CLEANING

3.6.1 Clean exterior finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.7 PROTECTION

3.7.1 Protect installed products from damage from weather and other causes during construction.

3.7.2 Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

3.7.2.1 Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

3.7.2.2 Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 06 2013



SECTION 06 4023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 This Section includes the following:

- 1.2.1.1 Interior standing and running trim.
- 1.2.1.2 Interior frames and jambs. (Match Existing wood trim)
- 1.2.1.3 Flush wood paneling and wainscots. (Walnut in Commissioner's Room)
- 1.2.1.4 Interior ornamental work. (Decorative Return Grill at Commissioner's Room)
- 1.2.1.5 Wood cabinets. (Walnut in Commissioner's Room 125 and Kitchen 115)
- 1.2.1.6 Plastic-laminate cabinets. (Permits Suite)
- 1.2.1.7 Solid-surfacing-material countertops. (All)
- 1.2.1.8 Closet and utility shelving.
- 1.2.1.9 Shop finishing of interior woodwork.

1.2.2 Related Sections include the following:

- 1.2.2.1 Division 06 Section "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.

1.3 DEFINITIONS

1.3.1 Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.4 SUBMITTALS

1.4.1 Product Data: For each type of product indicated, including cabinet hardware and accessories and finishing materials and processes.

1.4.2 Product Data: For panel products high-pressure decorative laminate solid-surfacing material cabinet hardware and accessories and finishing materials and processes.

1.4.2.1 Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

1.4.3 Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1.4.3.1 Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.

1.4.3.2 Show locations and sizes of cutouts and holes for plumbing fixtures faucets soap dispensers and other items installed in architectural woodwork.

1.4.3.3 Apply WI-certified compliance label to first page of Shop Drawings.

1.4.4 Samples for Initial Selection:

1.4.4.1 Shop-applied transparent finishes.

1.4.4.2 Shop-applied opaque finishes.

1.4.4.3 Plastic and Wood laminates.

1.4.4.4 Solid-surfacing materials.

1.4.5 Samples for Verification: Colors to be selected by the Architect from the manufacturers full range.

1.4.5.1 Veneer leaves representative of and selected from flitches to be used for transparent-finished woodwork.

1.4.5.2 Veneer-faced panel products with or for transparent finish, 8 by 10 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.

1.4.5.3 Lumber and panel products with shop-applied opaque finish, 50 sq. in. for lumber and 8 by 10 inches for panels, for each finish system and color, with 1/2 of exposed surface finished.

1.4.5.4 Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish.

1.4.5.5 Solid-surfacing materials, 6 inches square.

1.4.5.6 Corner pieces as follows:

1.4.5.7 Exposed cabinet hardware and accessories, one unit for each type and finish.

1.4.6 Product Certificates: For each type of product, signed by product manufacturer.

1.4.7 Woodwork Quality Standard Compliance Certificates: WI-certified compliance certificates.

1.4.8 Qualification Data: For fabricator.

1.5 QUALITY ASSURANCE

1.5.1 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. Shop is a licensee of WI's Certified Compliance Program.

1.5.2 Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers and wood doors with face veneers that are sequence matched with woodwork.

1.5.3 Quality Standard: Unless otherwise indicated, comply with WI's "Manual of Millwork" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1.5.3.1 Provide WI-certified compliance labels and certificates indicating that woodwork complies with requirements of grades specified.

1.5.4 Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.

1.5.5 Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Mock-up to be built showing indicated treatment of Commissioner's Room 125 wainscot and wall paneling paneling to full height and no less than 4 feet in width. Mock-up must be approved by architect prior to installation of wainscot or fireplace paneling.

1.5.5.1 Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5.6 Preinstallation Conference: Conduct conference at Project site.

1.6 DELIVERY, STORAGE, AND HANDLING

1.6.1 Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.7 PROJECT CONDITIONS

1.7.1 Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.7.2 Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during the remainder of the construction period.

1.7.3 Field Measurements: Where 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.

1.7.3.1 Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

1.8 COORDINATION

1.8.1 Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 WOODWORK FABRICATORS

2.1.1 Available Fabricators: Subject to compliance with requirements above, fabricators offering interior architectural woodwork that may be incorporated into the Work must be approved by the architect in writing prior to any work being performed.

2.2 MATERIALS

2.2.1 General: Provide materials that comply with requirements of WI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

2.2.2 Wood Species and Cut for Transparent Finish: Walnut in Commissioner's Room 125 and Kitchen 115

2.2.3 Wood Species for Opaque Finish: Any closed-grain hardwood.

2.2.4 Wood Products: Comply with the following:

2.2.4.1 Hardboard: AHA A135.4.

2.2.4.2 Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.

2.2.4.3 Softwood Plywood: DOC PS 1, Medium Density Overlay.

2.2.4.4 Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.

2.2.5 High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard. **High Pressure Laminate in Permit Office Suite. All countertops solid surface.**

2.2.5.1 Available Manufacturers: Subject to compliance with requirements, manufacturers offering high-pressure decorative laminates that may be incorporated into the Work include, but are not limited to, the following:

2.2.5.1.1 Abet Laminati, Inc.

2.2.5.1.2 Formica Corporation.

2.2.5.1.3 Lamin-Art, Inc.

2.2.5.1.4 Panolam Industries International Incorporated.

2.2.5.1.5 Wilsonart International; Div. of Premark International, Inc.

2.2.6 Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.

2.2.6.1 Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

2.2.6.1.1 E. I. du Pont de Nemours and Company.

2.2.6.1.2 Formica Corporation.

2.2.6.1.3 LG Chemical, Ltd.

2.2.6.1.4 Samsung; Cheil Industries Inc.

2.2.6.1.5 Swan Corporation (The).

2.2.6.1.6 Wilsonart International; Div. of Premark International, Inc.

- 2.2.6.2 Type: Standard type or Veneer type made from material complying with requirements for Standard type, as indicated, unless Special Purpose type is indicated.
- 2.2.6.3 Colors and Patterns: Match Architect's samples.

2.3 FIRE-RETARDANT-TREATED MATERIALS

2.3.1 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.

- 2.3.1.1 Do not use treated materials that do not comply with requirements of referenced woodworking standard or that are warped, discolored, or otherwise defective.
- 2.3.1.2 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.
- 2.3.1.3 Identify fire-retardant-treated materials with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

2.3.2 Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Comply with performance requirements of AWPA C20 (lumber) and AWPA C27 (plywood). Use the following treatment type:

- 2.3.2.1 Interior Type A: Low-hygroscopic formulation.
- 2.3.2.2 Mill lumber before treatment and implement special 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 treated woodwork.
- 2.3.2.3 Kiln-dry materials before and after treatment to levels required for untreated materials.

2.4 CABINET HARDWARE AND ACCESSORIES

2.4.1 General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 08 Section "Door Hardware (Scheduled by Describing Products)."

2.4.2 Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 135 degrees of opening, self-closing.

2.4.3 Back-Mounted Pulls: BHMA A156.9, B02011. As selected by the architect.

2.4.4 Catches: Push-in magnetic catches, BHMA A156.9, B03131.

2.4.5 Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

2.4.6 Drawer Slides: BHMA A156.9, B05091.

2.4.6.1 Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball-bearing slides.

2.4.6.2 Box Drawer Slides: Grade 1; for drawers not more than 6 inches high and 24 inches wide.

2.4.6.3 File Drawer Slides: Grade 1HD-100; for drawers more than 6 inches high or 24 inches wide.

2.4.6.4 Pencil Drawer Slides: Grade 2; for drawers not more than 3 inches high and 24 inches wide.

2.4.6.5 Keyboard Slides: Grade 1; for computer keyboard shelves.

2.4.7 Door Locks: BHMA A156.11, E07121.

2.4.8 Drawer Locks: BHMA A156.11, E07041.

2.4.9 Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.

2.4.9.1 Product: Subject to compliance with requirements, provide "OG series" by Doug Mockett & Company, Inc. Manufacturers are not limited to the preceding.

2.4.10 Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

2.4.10.1 Satin or Brushed Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base. or

2.4.10.2 Satin or Brushed Stainless Steel: BHMA 630.

2.4.11 For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.5 MISCELLANEOUS MATERIALS

2.5.1 Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.

2.5.2 Furring, Blocking, Shims, and Hanging Strips: Fire-retardant-treated softwood lumber, kiln dried to less than 15 percent moisture content.

2.5.3 Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors

and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.5.4 Adhesives, General: Do not use adhesives that contain urea formaldehyde.

2.5.5 VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

2.5.5.1 Wood Glues: 30 g/L.

2.5.5.2 Contact Adhesive: 250 g/L.

2.5.6 Adhesive for Bonding Plastic Laminate: Woodworker's option.

2.5.6.1 Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.6 FABRICATION, GENERAL

2.6.1 Interior Woodwork Grade: Unless otherwise indicated, provide Premium-grade interior woodwork complying with referenced quality standard.

2.6.2 Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

2.6.3 Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

2.6.4 Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

2.6.4.1 Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch Thick or Less: 1/16 inch.

2.6.4.2 Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.

2.6.4.3 Eased edges are not required at smooth stained paneling along recessed black reveals as indicated on drawings; such as lower portion of Great Room wainscot and at fireplace.

2.6.5 Complete fabrication, including assembly, finishing, and hardware application, 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.

- 2.6.5.1 Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
- 2.6.5.2 Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- 2.6.6 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.
 - 2.6.6.1 Seal edges of openings in countertops with a coat of varnish.
- 2.7 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH
 - 2.7.1 Grade: Premium.
 - 2.7.2 Wood Species and Cut: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building, unless otherwise indicated. Generally match Walnut paneling. In areas other than Commissioner's Room and Conference Room provide Birch where stain is used.
 - 2.7.3 For trim items wider than available lumber, use veneered construction. Do not glue for width.
 - 2.7.4 For rails wider or thicker than available lumber, use veneered construction. Do not glue for width or thickness.
 - 2.7.5 Assemble casings in plant except where limitations of access to place of installation require field assembly.
- 2.8 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH
 - 2.8.1 Grade: Custom.
 - 2.8.2 Wood Species: Any closed-grain hardwood.
 - 2.8.3 Assemble casings in plant except where limitations of access to place of installation require field assembly.

2.9 INTERIOR FRAMES AND JAMBS FOR TRANSPARENT FINISH

2.9.1 Grade: Premium.

2.9.2 Wood Species and Cut: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building, unless otherwise indicated.

2.9.3 Fire-Rated Interior Frames and Jambs: Products fabricated from fire-retardant particleboard or fire-retardant medium-density fiberboard with veneered, exposed surfaces and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

2.10 INTERIOR FRAMES AND JAMBS FOR OPAQUE FINISH

2.10.1 Grade: Custom.

2.10.2 Wood Species: Any closed-grain hardwood.

2.11 FLUSH WOOD PANELING AND WAINSCOTS – Commissioner's Room 125

2.11.1 Grade: Premium.

2.11.2 Wood Species and Cut: **Walnut. Other species will be approved by architect on a case by case basis prior to bid opening as a substitution.**

2.11.3 Note aluminum Z and U Channel trim between walnut panels in the Commissioner's Room. See Details on Architectural Drawing A7.0.

2.11.3.1 Lumber Trim and Edges: At fabricator's option, trim and edges indicated as solid wood (except moldings) may be either lumber or veneered construction compatible with grain and color of veneered panels.

2.11.4 Matching of Adjacent Veneer Leaves: Book match.

2.11.5 Veneer Matching within Panel Face: Center-balance match.

2.11.6 Panel-Matching Method: Match panels within each separate area by the following method:

2.11.6.1 Premanufactured sets used full width as indicated.

2.11.7 Fire-Retardant-Treated Paneling: Provide panels consisting of wood veneer and fire-retardant particleboard or fire-retardant medium-density fiberboard.

Panels shall have flame-spread index of 25 or less and smoke-developed index of 450 or less per ASTM E 84.

2.12 INTERIOR ORNAMENTAL WORK FOR TRANSPARENT FINISH

2.12.1 Interior ornamental work for transparent finish includes the following:

2.12.1.1 Grilles. HVAC returns in Commissioner's Room to have decorative laser cut stained wood grill.

2.12.2 Grade: Premium.

2.12.3 Wood return air grills to be laser cut in pattern as selected by the architect from available patterns.

2.12.4 Wood Species and Cut: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building, unless otherwise indicated. This section pertains to stained wood return air grills. .

2.13 WOOD CABINETS FOR TRANSPARENT FINISH

2.13.1 Grade: Premium.

2.13.2 WI Construction Style: Style B, Face Frame.

2.13.3 WI Construction Type: Type I, multiple self-supporting units rigidly joined together.

2.13.4 WI Door and Drawer Front Style: Flush overlay.

2.13.5 Wood Species and Cut for Exposed Surfaces: Walnut in Commissioner's Room 125 and Kitchen 115.

2.13.5.1 Grain Direction: Horizontally for drawer fronts, doors, and fixed panels.

2.13.5.2 Matching of Veneer Leaves: Book match.

2.13.5.3 Veneer Matching within Panel Face: Center-balance match.

2.13.6 Semiexposed Surfaces: Provide surface materials indicated below:

2.13.6.1 Surfaces Other Than Drawer Bodies: Same species and cut indicated for exposed surfaces.

2.13.6.2 Drawer Sides and Backs: Solid-hardwood lumber, same species indicated for exposed surfaces.

2.13.6.3 Drawer Bottoms: Hardwood plywood.

2.14 PLASTIC-LAMINATE CABINETS – Permits Suite

2.14.1 Grade: Custom.

2.14.2 WI Construction Style: Style B, Face Frame.

2.14.3 WI Construction Type: Type I, multiple self-supporting units rigidly joined together.

2.14.4 WI Door and Drawer Front Style: Flush overlay.

2.14.5 Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:

2.14.5.1 Horizontal Surfaces Other Than Tops: Grade HGS.

2.14.5.2 Postformed Surfaces: Grade HGP.

2.14.5.3 Vertical Surfaces: Grade HGS.

2.14.5.4 Edges: Grade HGS.

2.14.6 Materials for Semiexposed Surfaces:

2.14.6.1 Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.

2.14.6.1.1 Edges of Plastic-Laminate Shelves: PVC tape, 0.018-inch minimum thickness, matching laminate in color, pattern, and finish.

2.14.6.1.2 For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade VGS.

2.14.6.2 Drawer Sides and Backs: Solid-hardwood lumber.

2.14.6.3 Drawer Bottoms: Hardwood plywood.

2.14.7 Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

2.14.8 Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

2.14.8.1 As selected by Architect from laminate manufacturer's full range in the following categories:

2.14.8.1.1 Solid colors, matte finish.

2.14.8.1.2 Solid colors with core same color as surface, matte finish.

2.14.8.1.3 Patterns, matte finish.

2.15 SOLID-SURFACING-MATERIAL COUNTERTOPS- All Countertops

2.15.1 Grade: Premium.

2.15.2 Solid-Surfacing-Material Thickness: 3/4 inch.

2.15.3 Colors, Patterns, and Finishes: Provide materials and products that result in colors of solid-surfacing material complying with the following requirements:

2.15.3.1 As selected by Architect from manufacturer's full range.

2.15.4 Fabricate tops in one piece, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

2.15.4.1 Fabricate tops with shop-applied edges of materials and configuration indicated.

2.15.4.2 Fabricate tops with shop-applied backsplashes.

2.15.5 Drill holes in countertops for plumbing fittings and soap dispensers in shop.

2.16 CLOSET AND UTILITY SHELVING

2.16.1 Grade: Custom.

2.16.2 Shelf Material: 3/4-inch veneer-faced panel product with solid-lumber edge.

2.16.3 Cleats: 3/4-inch solid lumber.

2.16.4 Wood Species: Match species indicated for door to closet where shelving is located.

2.17 SHOP FINISHING

2.17.1 Grade: Provide finishes of same grades as items to be finished.

2.17.2 General: Shop finish transparent-finished interior architectural woodwork at fabrication shop as specified in this Section. Refer to Division 09 painting Sections for finishing opaque-finished architectural woodwork.

2.17.3 Preparation for Finishing: 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.

2.17.4 Transparent Finish:

- 2.17.4.1 Grade: Premium.
- 2.17.4.2 WI Finish System 2: Water-reducible acrylic lacquer.
- 2.17.4.3 Staining: Match Architect's sample.
- 2.17.4.4 Wash Coat for Stained Finish: Apply wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.
- 2.17.4.5 Filled Finish for Open-Grain Woods: After staining (if any), apply paste wood filler to open-grain woods and wipe off excess. Tint filler to match stained wood.

2.17.4.5.1 Apply wash-coat sealer after staining and before filling.

- 2.17.4.6 Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

2.17.5 Opaque Finish:

- 2.17.5.1 Grade: Premium.
- 2.17.5.2 WI Finish System 7a.: Synthetic enamel.
- 2.17.5.3 Color: As selected by Architect from manufacturer's full range.
- 2.17.5.4 Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 PREPARATION

- 3.1.1 Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- 3.1.2 Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- 3.2.1 Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- 3.2.2 Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.

- 3.2.3 Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
- 3.2.4 Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- 3.2.5 Fire-Retardant-Treated Wood: Handle, store, and install fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions, including those for adhesives used to install woodwork.
- 3.2.6 Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails [**or finishing screws**] for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- 3.2.7 Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches long, except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.
- 3.2.7.1 Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
- 3.2.7.2 Install wall railings on indicated metal brackets securely fastened to wall framing.
- 3.2.7.3 Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.
- 3.2.8 Paneling: Anchor paneling to supporting substrate with splined connection strips. Do not use face fastening, unless covered by trim.
- 3.2.8.1 Install flush paneling 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.
- 3.2.9 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 installation of hardware and accessory items as indicated.
- 3.2.9.1 Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
- 3.2.9.2 Maintain veneer sequence matching of cabinets with transparent finish.

- 3.2.9.3 Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.
- 3.2.10 Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 3.2.10.1 Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 - 3.2.10.2 Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 3.2.10.3 Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."
- 3.2.11 Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
- 3.2.12 Refer to Division 09 Sections for final finishing of installed architectural woodwork not indicated to be shop finished.
- 3.3 ADJUSTING AND CLEANING
 - 3.3.1 Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
 - 3.3.2 Clean, lubricate, and adjust hardware.
 - 3.3.3 Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06 4023



SECTION 072200 – SPRAY APPLIED INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 Section Includes:

1.2.1.1 Spray-applied Polyurethane foam insulation

1.2.2 Related Sections:

1.2.2.1 Division 07 Section "Fire-Resistive Joint Systems" for insulation installed as part of a perimeter fire-resistive joint system.

1.3 SUBMITTALS

1.3.1 Product Data: For each type of product indicated.

1.3.2 Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

1.4 QUALITY ASSURANCE

1.4.1 Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Provide testing reports of applicable testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 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.



PART 2 - PRODUCTS

2.1 SPRAY-APPLIED POLYURETHANE FOAM INSULATION

2.1.1 Base Bid- Open Cell Spray-Applied Polyurethane Foam.

PART 3 - EXECUTION

3.1 PREPARATION

3.1.1 Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

3.2.1 Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

3.2.2 Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

3.2.3 Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

3.2.4 Provide thickness to fit applications indicated. Apply thickness required to consistently achieve the indicated R-value of R-30 or (equivalent thermal protection rating taking into account air infiltration).

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

3.3.1 Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

3.3.2 Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

3.3.2.1 Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION 072100



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



SECTION 07 3113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 Section Includes:

- 1.2.1.1 Architectural Asphalt shingles.
- 1.2.1.2 Underlayment.

1.2.2 Related Sections:

- 1.2.2.1 Division 06 Section "Pre-Engineered Metal Trusses"
- 1.2.2.2 Division 06 Section "Sheathing" for roof sheathing.
- 1.2.2.3 Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings and flashings.

1.3 DEFINITION

- 1.3.1 Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

- 1.4.1 Product Data: For each type of product indicated.

- 1.4.2 Samples for Initial Selection: For each type of asphalt shingle ridge and hip cap shingles ridge vent and exposed valley lining indicated.

- 1.4.2.1 Include similar Samples of trim and accessories involving color selection.

- 1.4.3 Samples for Verification: For the following products, of sizes indicated, to verify color selected:

- 1.4.3.1 Asphalt Shingle: Full size.

- 1.4.4 Qualification Data: For qualified Installer.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- 1.4.5 Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.
- 1.4.6 Research/Evaluation Reports: For each type of asphalt shingle required, from the ICC.
- 1.4.7 Maintenance Data: For each type of asphalt shingle to include in maintenance manuals.
- 1.4.8 Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

- 1.5.1 Installer Qualifications: **Manufacturer's authorized representative** who is trained and approved for installation of units required for this Project.
- 1.5.2 Source Limitations: Obtain ridge and hip cap shingles ridge vents felt underlayment and self-adhering sheet underlayment from single source from single manufacturer.
- 1.5.3 Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1.5.3.1 Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- 1.6.1 Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions, not to exceed 110 degrees F. Do not store in direct sunlight. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
 - 1.6.1.1 Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.
- 1.6.2 Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 PROJECT CONDITIONS

- 1.7.1 Environmental Limitations: Do not deliver or install asphalt shingles until spaces are enclosed and weathertight. Work to be performed under conditions in accordance with manufacturer's recommendations.
 - 1.7.1.1 Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.



1.8 WARRANTY

1.8.1 Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.

1.8.1.1 Failures include, but are not limited to, the following:

1.8.1.1.1 Manufacturing defects.

1.8.1.1.2 Structural failures including failure of asphalt shingles to self-seal after a reasonable time.

1.8.1.2 Material Warranty Period: 40 years from date of Substantial Completion, prorated, with first 12 years non-prorated.

1.8.1.3 Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to **100 mph** for 10 years from date of Substantial Completion.

1.8.1.4 Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.

1.8.1.5 Workmanship Warranty Period: 12 years from date of Substantial Completion.

1.8.2 Special Project Warranty: Roofing Installer's Warranty, covering the Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within 10 years of substantial completion. Use warranty at the end of this section.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED SELF-SEALING ASPHALT SHINGLES

NOTE: Basis of Design for pricing only. SHINGLES TO MATCH EXISTING

2.1.1 Heavyweight, granule surfaced, self sealing asphalt shingle with a strong fiberglass reinforced Micro Weave (or equivalent) core and a mineral granule surfacing. Meets ASTM D 3018, ASTM D 3161, and ASTM D 3462.

2.1.1.1 Basis-of-Design Product: Subject to compliance with requirements, provide Timberline Prestique 40 or Timberline Prestique Shingles, by GAF/ELK or comparable product by one of the following:

2.1.1.1.1 Atlas Roofing Corporation- Storm Master.

2.1.1.1.2 CertainTeed Corporation- Grand Manor, Landmark Premium or Presidential Shake.

2.1.1.1.3 GAF/ELK- Timberline Prestique 40, Timberline Prestique or Grand Canyon

2.1.1.1.4 Owens Corning- Berkshire, Woodmoor or WeatherGuard



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

2.1.1.1.5 PABCO Roofing Products- Paramount Advantage, Paramount Signature or Premier Advantage

2.1.1.2 Algae Resistance: Granules treated to resist algae discoloration

2.1.1.3 Provide Stain Guard Protection.

2.1.1.4 Color and Blends: As selected by Architect from manufacturer's full range.

2.1.2 Starter Strip, SBS-Modified Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing; complying with UL 2218, Class IV.

2.1.2.1 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; use same as shingle manufacturer whenever possible:

2.1.2.1.1 Atlas Roofing Corporation

2.1.2.1.2 CertainTeed Corporation

2.1.2.1.3 GAF/ELK

2.1.2.1.4 Owens Corning

2.1.2.1.5 PABCO Roofing Products

2.1.2.2 Self sealing starter course. Each strip measures 7" tall by 36" wide. One bundle covers approx. 33 lineal feet. Strip Size:

2.1.2.3 Algae Resistance: Granules treated to resist algae discoloration.

2.1.2.4 Color and Blends: As selected by Architect from manufacturer's full range.

2.1.3 Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.2 UNDERLAYMENT MATERIALS

2.2.1 Felt: ASTM D 4869, Type II, asphalt-saturated organic felts, non-perforated.

2.3 RIDGE VENTS

2.3.1 See Division 07 Section "Roof Specialties" for further information on ridge vents.

2.3.2 Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent with nonwoven geotextile filter strips; for use under ridge shingles.

2.3.2.1 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; use same as shingle manufacturer whenever possible:

2.3.2.1.1 Atlas Roofing Corporation

2.3.2.1.2 CertainTeed Corporation

- 2.3.2.1.3 GAF/ELK
- 2.3.2.1.4 Owens Corning
- 2.3.2.1.5 PABCO Roofing Products

2.3.2.2 Minimum Net Free Area: 18.5 sq in NFVA per lineal foot

2.4 ACCESSORIES

2.4.1 Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

2.4.2 Roofing Nails: Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, barbed or deformed shank, with heads 3/8 inch (9.5 mm) to 7/16 inch (11 mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19 mm) or through plywood or oriented strand board by at least 1/8 inch.

2.4.2.1 Where nails are in contact with metal flashing, use nails made from same metal as flashing.

2.4.3 Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch minimum diameter.

2.5 METAL FLASHING AND TRIM

2.5.1 General: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim."

2.5.1.1 Sheet Metal: Zinc-tin alloy-coated steel or Aluminum, mill finished.

2.5.2 Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

2.5.2.1 Apron Flashings: Fabricate with lower flange a minimum of 5 inches over and 4 inches beyond each side of downslope asphalt shingles and 6 inches up the vertical surface.

2.5.2.2 Step Flashings: Fabricate with a headlap of 2 inches and a minimum extension of 5 inches over the underlying asphalt shingle and up the vertical surface.

2.5.2.3 Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches beneath upslope asphalt shingles and 6 inches beyond each side of vertical surface and 6 inches above the roof plane.

2.5.2.4 Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet with 1-inch-high, inverted-V profile at center of valley and equal flange widths of 12 inches.

2.5.2.5 Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

2.5.3 Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof, and extending at least 4 inches from pipe onto roof.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

PART 3 - EXECUTION

1.01 EXAMINATION

- A. Do not begin installation until the roof deck has been properly prepared.
- B. If roof deck preparation is the responsibility of another installer, notify the architect or building owner of unsatisfactory preparation before proceeding.

1.02 PREPARATION

- A. Verify that the deck is dry, sound, clean and smooth. It shall be free of any depressions, waves, and projections. Cover with sheet metal, all holes over 1 inch (25 mm) in diameter, cracks over 1/2 inch (12 mm) in width, loose knots and excessively resinous areas.
- B. Replace damaged deck with new materials.
- C. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

1.03 PREPARATION

- A. Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.
- B. At areas that receive eaves protection membrane, fill knotholes and cracks with latex filler.
- C. Install crickets on the upslope side of all chimneys in the north, any chimney wider than 24", and on all roofs steeper than 6/12.

1.04 PREPARATION

- A. Verify that the deck is structurally sound and free of deteriorated decking. All deteriorated decking shall be removed and replaced with new materials.

1.05 UNDERLAYMENT APPLICATION

- A. General:
 - 1. Install using methods recommended by manufacturer, in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence. Coordinate underlayment installation with manufacturer of impregnated sheathing system.

- B. Eaves:

1. Install eaves edge metal flashing tight with fascia boards; lap joints 2 inches (50 mm) and seal with plastic cement; nail at the top of the flange.

C. Valleys:

1. Install eaves protection membrane at least 36 inches wide and centered on the valley. Lap ends 6 inches (150 mm) and seal.
2. Where valleys are indicated to be "open valleys", install metal flashing over eaves protection membrane before roof deck underlayment is installed; DO NOT nail through the flashing. Secure the flashing by nailing at 18 inches (457 mm) on center just beyond edge of flashing so that nail heads hold down the edge.

D. Roof Deck:

1. Install one layer of roof deck underlayment over the entire area not protected by eaves or valley membrane. Install sheets horizontally so water sheds and nail in place.
2. On roofs sloped at more than 4 in 12, lap horizontal edges at least 2 inches (50 mm) and at least 2 inches (50 mm) over eaves protection membrane.
3. On roofs sloped between 2 in 12 and 4 in 12, lap horizontal edges at least 19 inches (480 mm) and at least 19 inches (485 mm) over eaves protection membrane.
4. Lap ends at least 4 inches (100 mm). Stagger end laps of each layer at least 36 inches (915 mm).
5. Lap underlayment over valley protection at least 6 inches (150 mm).

E. Penetrations:

1. Vent pipes: Install a 24 inch (610 mm) square piece of eaves protection membrane lapping over roof deck underlayment; seal tightly to pipe.
2. Vertical walls: Install eaves protection membrane extending at least 6 inches (150 mm) up the wall and 12 inches (305 mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
3. Chimneys: Install eaves protection membrane around entire chimney extending at least 6 inches (150 mm) up the wall and 12 inches (305 mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
4. Rake Edges: Install metal edge flashing over eaves protection membrane and roof deck underlayment; set tight to rake boards; lap joints at least 2 inches (50 mm) and seal with plastic cement; secure with nails.

1.06 INSTALLATION OF SHINGLES

A. General:

1. Install in accordance with manufacturer's instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

2. Minimize breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).
 3. Handle carefully in hot weather to avoid scuffing the surfacing, or damaging the shingle edges.
- B. Placement and Nailing:
1. Secure with 4, 5, or 6 nails per shingle per manufacturer's instructions or local codes.
 2. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
 3. Nails must be driven flush with the shingle surface. Do not overdrive or underdrive the nails.
 4. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
- C. Placement and Nailing:
1. Beginning with the starter strip, trim shingles so that they "nest" within the shingle located beneath it. This procedure will yield a first course that is typically 3" to 4" rather than a fully exposed shingle.
 2. Laterally, offset the new shingles from the existing keyways, to avoid waves or depressions caused by excessive dips in the roofing materials.
 3. Using the bottom of the tab on existing shingles, align subsequent courses.
**Note: DO NOT install standard sized shingles (5" exposure) over metric (5 5/8" exposure) shingles, as it will overexpose the shingles and reveal the nails. Use standard alignment methods to assure proper shingle placement.*
 4. Secure with 4, 5, or 6 nails per shingle per manufacturer's instructions or local codes.
 5. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
 6. Nails must be driven flush with the shingle surface. Do not overdrive or underdrive the nails.
 7. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
- D. Valleys
1. Install valleys using the "open valley" method:
 - a) Snap diverging chalk lines on the metal flashing, starting at 3 inches (75 mm) each side of top of valley, spreading at 1/8 inch per foot (9 mm per meter) to the eaves.
 - b) Run shingles to chalk line.
 - c) Trim last shingle in each course to match the chalk line; do not trim shingles to less than 12 inches (305 mm) wide.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- d) Apply a 2 inch (50 mm) wide strip of plastic cement under ends of shingles, sealing them to the metal flashing.
2. Install valleys using the "closed cut valley" method:
 - a) Run the first course of shingles from the higher roof slope across the valley at least 12 inches (305 mm).
 - b) Run succeeding courses of shingles from the lower roof slope across the valley at least 12 inches (305 mm) and nail not closer than 6 inches (150 mm) to center of valley.
 - c) Run shingles from the upper roof slope into the valley and trim 2 inches (50 mm) from the center line.

E. Penetrations

1. All Penetrations are to be flashed according to manufacturer, ARMA and NRCA application instructions and construction details.

1.07 VENTILATION

A. General

1. Ventilation must meet or exceed current F.H.A., H.U.D. and local code requirements.

B. Ridge / Soffit ventilation

1. Install ridge vent along the entire length of ridges or as indicated on roof plan:
2. Cut continuous vent slots through the sheathing, stopping 6 inches (150 mm) from each end of the ridge.
3. On roofs with a ridge board, make two slots 1-3/4 inches (42 mm) wide, one on each side.
4. Install ridge vent material along the full length of the ridge, including uncut areas.
5. Butt ends of ridge vent material and join using roofing cement.
6. Install eaves vents in sufficient quantity to equal or exceed the ridge vent area.

1.08 PROTECTION

- A. Protect installed products from foot traffic until completion of the project.
- B. Any roof areas that are not completed by the end of the workday are to be protected from moisture and contaminants.

3.1 ROOFING INSTALLER'S WARRANTY

3.1.1 WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

- 3.1.1.1 Owner: <Insert name of Owner>.
 - 3.1.1.2 Address: <Insert address>.
 - 3.1.1.3 Building Name/Type: <Insert information>.
 - 3.1.1.4 Address: <Insert address>.
 - 3.1.1.5 Area of Work: <Insert information>.
 - 3.1.1.6 Acceptance Date: <Insert date>.
 - 3.1.1.7 Warranty Period: <Insert time>.
 - 3.1.1.8 Expiration Date: <Insert date>.
- 3.1.2 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,
- 3.1.3 NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his 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.
- 3.1.4 This Warranty is made subject to the following terms and conditions:
- 3.1.4.1 Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - 3.1.4.1.1 Lightning;
 - 3.1.4.1.2 Peak gust wind speed exceeding 100 mph;
 - 3.1.4.1.3 Fire;
 - 3.1.4.1.4 Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - 3.1.4.1.5 Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - 3.1.4.1.6 Vapor condensation on bottom of roofing; and
 - 3.1.4.1.7 Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 - 3.1.4.2 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.
 - 3.1.4.3 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.
 - 3.1.4.4 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



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

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.

- 3.1.4.5 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.
- 3.1.4.6 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.
- 3.1.4.7 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.

3.1.5 IN WITNESS THEREOF, this instrument has been duly executed this **<Insert day>** day of **<Insert month>**, **<Insert year>**.

- 3.1.5.1 Authorized Signature: **<Insert signature>**.
- 3.1.5.2 Name: **<Insert name>**.
- 3.1.5.3 Title: **<Insert title>**.

END OF SECTION 07 3113



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



SECTION 07 6200 - SHEET METAL FLASHING AND TRIM

GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 Section Includes:

1.2.1.1 Manufactured Products:

1.2.1.1.1 Manufactured through-wall flashing.

1.2.1.1.2 Cap Flashing

1.2.2 Related Sections:

Division 06 Section "Rough Carpentry" for wood nailers, curbs, and blocking.

1.3 PERFORMANCE REQUIREMENTS

1.3.1 General: Sheet metal flashing and trim assemblies as indicated shall 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 shall not rattle, leak, or loosen, and shall remain watertight.

Fabricate and install roof edge flashing capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:

Wind Zone 2: For velocity pressures of 100-lbf/sq. ft. perimeter uplift force, 120-lbf/sq. ft. corner uplift force, and 45-lbf/sq. ft. outward force.

1.3.3 Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.

Temperature Change (Range): 120 deg F, ambient;

1.4 SUBMITTALS

Product Data: For each type of product indicated. Include construction details, material



descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

Qualification Data: For qualified fabricator.

1.4.3 Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

1.4.4 Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

1.5.1 Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

DELIVERY, STORAGE, AND HANDLING

1.6.1 Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

1.6.2 Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.7 WARRANTY

Special Warranty on Finishes: Manufacturer's standard form in which 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.

1.7.1.1 Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

1.7.1.1.1 Color fading more than 5 Hunter units when tested according to ASTM D 2244.

1.7.1.1.2 Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

1.7.1.1.3 Cracking, checking, peeling, or failure of paint to adhere to bare metal.

Finish Warranty Period: 20 years from date of Substantial Completion.



PART 2 - PRODUCTS

2.3 MISCELLANEOUS MATERIALS

2.3.1 General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

2.3.2 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.

2.3.2.3 Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.

2.3.2.4 Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

2.3.4 Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch wide and 1/8 inch thick.

Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

2.3.9 Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 MANUFACTURED SHEET METAL FLASHING AND TRIM

Through-Wall Ribbed Sheet Metal Flashing: Manufacture through-wall sheet metal flashing for embedment in masonry with ribs at 3-inch intervals along length of flashing to provide an integral mortar bond. Manufacture through-wall flashing with snaplock receiver on exterior face to receive counterflashing

2.4.1.2 Stainless Steel: 0.016 inch thick.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

2.4.1.2.1.1 Cheney Flashing Company; Cheney Flashing (Dovetail).

2.4.1.2.1.2 Cheney Flashing Company; Cheney Flashing (Sawtooth).

2.4.1.2.1.3 Hohmann & Barnard, Inc.; STF Sawtooth Flashing.

2.4.1.2.1.4 Keystone Flashing Company, Inc.; Keystone Three-Way Interlocking Thruwall Flashing.

2.4.1.2.1.5 Sandell Manufacturing Company, Inc.; Pre-Formed Metal Flashing.



Finish: With manufacturer's standard color coating.

2.5 FABRICATION, GENERAL

General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.

- 2.5.1.1 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.
- 2.5.1.2 Obtain field measurements for accurate fit before shop fabrication.
- 2.5.1.3 Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
- 2.5.1.4 Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

Fabrication Tolerances: 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 as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

2.5.4 Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant.

2.5.5 Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

2.5.6 Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

Fabricate cleats and attachment devices of sizes as recommended by SMACNA's "Architectural Sheet Metal Manual" for application, but not less than thickness of metal being secured.

Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

Do not use graphite pencils to mark metal surfaces.



2.9 WALL SHEET METAL FABRICATIONS

Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot- long, sections, under copings, at shelf angles, and where indicated. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings. Form with 2-inch- high, end dams where flashing is discontinuous. Fabricate from the following materials:

2.9.1.3 Zinc-Tin Alloy-Coated Stainless Steel: 0.015 inch

Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high, end dams. Fabricate from the following materials:

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of the Work.

Verify compliance with requirements for installation tolerances of substrates.

3.1.1.2 Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION, GENERAL

3.3.1 General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

3.3.1.1 Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

3.3.1.2 Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

3.3.1.3 Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

3.3.1.4 Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

3.3.1.5 Install sealant tape where indicated.

3.3.1.6 Torch cutting of sheet metal flashing and trim is not permitted.
Do not use graphite pencils to mark metal surfaces.

3.3.2 Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by SMACNA.

3.3.2.1 Coat back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

3.3.2.2 Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene sheet.

3.3.3 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 watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

3.3.4 Fastener Sizes: Use fasteners of sizes that will penetrate wood sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

3.3.5 Seal joints as shown and as required for watertight construction.

3.3.5.1 Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.

3.3.5.2 Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

Do not solder metallic-coated steel and aluminum sheet.

3.5 ROOF FLASHING INSTALLATION

General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 24-inch centers.



3.5.5 Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.

Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.

Anchor interior leg of coping with screw fasteners and washers at 24-inch centers.

3.5.6 Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of interlocking folded seam or blind rivets and sealant.

3.5.8 Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

ERECTION TOLERANCES

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 as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8.2 Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.9 CLEANING AND PROTECTION

Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

Clean and neutralize flux materials.

3.9.3 Clean off excess sealants.

3.9.4 Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

3.9.5 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.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

END OF SECTION 07 6200



SECTION 07 8413 - PENETRATION FIRESTOPPING

GENERAL

RELATED DOCUMENTS

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

SUMMARY

Section Includes:

- Penetrations in fire-resistance-rated walls.
- Penetrations in horizontal assemblies.
- Penetrations in smoke barriers.

SUBMITTALS

Product Data: For each type of product indicated.

Product Schedule: For each penetration firestopping system. Include location and design designation of qualified testing and inspecting agency.

Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.

Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

QUALITY ASSURANCE

Installer Qualifications: A firm experienced in installing penetration firestopping similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its penetration firestopping products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.



Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:

Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.

Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:

Penetration firestopping products bear classification marking of qualified testing and inspecting agency.

Classification markings on penetration firestopping correspond to designations listed by the following:

UL in its "Fire Resistance Directory."

PROJECT CONDITIONS

Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.

Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

COORDINATION

Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.

Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

PRODUCTS

MANUFACTURERS

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/D Fire Protection Systems Inc.

Hilti, Inc.

Johns Manville.

Nelson Firestop Products.

NUCO Inc.

Specified Technologies Inc.

3M Fire Protection Products.

Tremco, Inc.; Tremco Fire Protection Systems Group.



USG Corporation.

PENETRATION FIRESTOPPING

Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

Fire-resistance-rated walls include smoke-barrier walls and fire partitions.

F-Rating: Not less than the fire-resistance rating of constructions penetrated.

Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.

Horizontal assemblies include ceiling membranes of roof/ceiling assemblies.

F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.

Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.

L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.

Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

VOC Content: Provide penetration firestopping that complies with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

Architectural Sealants: 250 g/L.

Sealant Primers for Nonporous Substrates: 250 g/L.

Sealant Primers for Porous Substrates: 775 g/L.

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 manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.

Permanent forming/damming/backing materials, including the following:

Slag-wool-fiber or rock-wool-fiber insulation.

Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.

Fillers for sealants.

Temporary forming materials.



Substrate primers.
Collars.

FILL MATERIALS

Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.

Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

MIXING

For those products requiring mixing before application, comply with penetration firestopping 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.

EXECUTION

EXAMINATION

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.

Proceed with installation only after unsatisfactory conditions have been corrected.

PREPARATION

Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:

Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.

Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.

Priming: 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.

Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

INSTALLATION

General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

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 indicated.

After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.

Install fill materials for firestopping by proven techniques to produce the following results:

Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

CLEANING AND PROTECTION

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 manufacturers and that do not damage materials in which openings occur.

Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is 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 and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 8413



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



SECTION 07 9200 - JOINT SEALANTS

GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 Section Includes:

- 1.2.1.1 Silicone joint sealants.
- 1.2.1.2 Urethane joint sealants.
- 1.2.1.3 Latex joint sealants.

1.2.2 Related Sections:

- 1.2.2.3 Division 07 Section "Fire-Resistive Joint Systems" for sealing joints in fire-resistance-rated construction.
- 1.2.2.4 Division 04 Section "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
- 1.2.2.5 Division 08 Section "Glazing" for glazing sealants.
- 1.2.2.6 Division 09 Section "Gypsum Board" for sealing perimeter joints.
- 1.2.2.7 Division 09 Section "Tiling" for sealing tile joints.
- 1.2.2.8 Division 09 Section "Acoustical Tile Ceilings" for sealing edge moldings at perimeters with acoustical sealant.
- 1.2.2.9 Division 32 Section "Concrete Paving Joint Sealants" for sealing joints in pavements, walkways, and curbing.

1.3 PRECONSTRUCTION TESTING

Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

- 1.3.1.1 Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- 1.3.1.2 Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

1.3.1.3 For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

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.

1.4 SUBMITTALS

Product Data: For each joint-sealant product indicated.

1.4.5 Joint-Sealant Schedule: Include the following information:

1.4.5.1 Joint-sealant application, joint location, and designation.

1.4.5.2 Joint-sealant manufacturer and product name.

1.4.5.3 Joint-sealant formulation.

1.4.5.4 Joint-sealant color.

Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

1.4.9 Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1.4.10.1 Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

1.4.10.2 Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.4.13 Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

1.5.1 Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

1.5.2 Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.

1.6 PROJECT CONDITIONS

1.6.1 Do not proceed with installation of joint sealants under the following conditions:

North Main Annex

Bid Set

- 1.6.1.1 When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
- 1.6.1.2 When joint substrates are wet.
- 1.6.1.3 Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
- 1.6.1.4 Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

Special 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 specified warranty period.

Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

2.1.1 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.

2.1.3 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.

Suitability for Immersion in Liquids (Planter Boxes). Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

Colors of Exposed Joint Sealants: As indicated by manufacturer's designations

2.2 SILICONE JOINT SEALANTS

2.2.1 Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

2.2.1.1.1 Pecora Corporation; 898.

2.3 URETHANE JOINT SEALANTS

2.3.12 Immersible Multicomponent, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Uses T and I.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- 2.3.12.1.1 BASF Building Systems; Sonolastic NP 2.
- 2.3.12.1.2 LymTal International, Inc.; Iso-Flex 885 SG.
- 2.3.12.1.3 May National Associates, Inc.; Bondaflex PUR 2 NS.
- 2.3.12.1.4 Pecora Corporation; Dynatred.
- 2.3.12.1.5 Tremco Incorporated; Vulkem 227.

2.5 LATEX JOINT SEALANTS

Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- 2.5.1.1.1 BASF Building Systems; Sonolac.
- 2.5.1.1.2 Bostik, Inc.; Chem-Calk 600.
- 2.5.1.1.3 May National Associates, Inc.; Bondaflex 600
- 2.5.1.1.4 Pecora Corporation; AC-20+.
- 2.5.1.1.5 Schnee-Morehead, Inc.; SM 8200.
- 2.5.1.1.6 Tremco Incorporated; Tremflex 834.

2.9 JOINT SEALANT BACKING

2.9.1 General: Provide sealant backings of material that 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.

North Main Annex

Bid Set

2.9.3 Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

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.

2.10.2 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.

2.10.3 Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

3.1.1 Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

3.1.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

3.2.1 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:

3.2.1.1 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.

3.2.1.2 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:

Concrete.

3.2.1.2.2 Masonry.

3.2.1.2.3 Unglazed surfaces of ceramic tile.

3.2.1.3 Remove laitance and form-release agents from concrete.

3.2.1.4 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:

Metal.

3.2.1.4.2 Glass.

3.2.1.4.4 Glazed surfaces of ceramic tile.

3.2.2 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.

3.2.3 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

3.3.1 General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

3.3.2 Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

3.3.3 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.

3.3.3.1 Do not leave gaps between ends of sealant backings.

3.3.3.2 Do not stretch, twist, puncture, or tear sealant backings.

3.3.3.3 Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

3.3.5 Install sealants using proven techniques that comply with the following and at the same time backings are installed:

3.3.5.1 Place sealants so they directly contact and fully wet joint substrates.

- 3.3.5.2 Completely fill recesses in each joint configuration.
- 3.3.5.3 Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- 3.3.6 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.
 - 3.3.6.1 Remove excess sealant from surfaces adjacent to joints.
 - 3.3.6.2 Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- 3.3.6.4 Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
- 3.3.6.5 Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - 3.3.6.5.1 Use masking tape to protect surfaces adjacent to recessed tooled joints.

Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

- 3.3.7.1 Apply masking tape to each side of joint, outside of area to be covered by sealant system.
- 3.3.7.2 Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch. Hold edge of sealant bead 1/4 inch inside masking tape.
- 3.3.7.3 Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
- 3.3.7.4 Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

3.4 FIELD QUALITY CONTROL

Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

- 3.4.1.1 Extent of Testing: Test completed and cured sealant joints as follows:

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.

- 3.4.1.2.1 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.

3.4.1.3 Inspect tested joints and report on the following:

- 3.4.1.3.1 Whether sealants filled joint cavities and are free of voids.
- 3.4.1.3.2 Whether sealant dimensions and configurations comply with specified requirements.
- 3.4.1.3.3 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 passes sealant manufacturer's field-adhesion hand-pull test criteria.

3.4.1.4 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.

3.4.2 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

3.5.1 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

3.6.1 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 and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

3.7.1 Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

3.7.1.1 Joint Locations:

- 3.7.1.1.1 Control and expansion joints in brick pavers.
- 3.7.1.1.2 Isolation and contraction joints in cast-in-place concrete slabs.
- 3.7.1.1.6 Joints between different materials listed above.
- 3.7.1.1.8 Other joints as indicated.

Silicone Joint Sealant: Single component, nonsag, traffic grade, neutral curing.



3.7.1.7 Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

3.7.3 Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

3.7.3.1 Joint Locations:

3.7.3.1.3 Control and expansion joints in unit masonry.

3.7.3.1.4 Joints in dimension stone cladding.

3.7.3.1.8 Joints between different materials listed above.

3.7.3.1.9 Perimeter joints between materials listed above and frames of doors, windows and louvers.

3.7.3.1.10 Control and expansion joints in ceilings and other overhead surfaces.

Silicone Joint Sealant: Single component, nonsag, neutral curing, Class 25

3.7.3.7 Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

3.7.4 Joint-Sealant Application: Interior joints in horizontal traffic surfaces

3.7.4.1 Joint Locations:

3.7.4.1.1 Isolation joints in cast-in-place concrete slabs.

Silicone Joint Sealant: Single component, nonsag, traffic grade, neutral curing

3.7.5 Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces

3.7.5.1 Joint Locations:

3.7.5.1.2 Perimeter joints of exterior openings where indicated.

3.7.5.1.3 Tile control and expansion joints.

3.7.5.1.4 Vertical joints on exposed surfaces of interior unit masonry

3.7.5.1.6 Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.

3.7.5.2 Joint Sealant: Latex.

3.7.5.3 Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

3.7.6 Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

3.7.6.1 Joint Sealant Location:



North Main Annex

Bid Set

- 3.7.6.1.1 Joints between plumbing fixtures and adjoining walls, floors, and counters.
- 3.7.6.1.2 Tile control and expansion joints where indicated.

- 3.7.6.2 Joint Sealant: Mildew resistant, single component, nonsag, neutral curing, Silicone
- 3.7.6.3 Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 07 9200

SECTION 081113 - HOLLOW METAL 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. Standard and custom hollow metal frames.
- 2. Steel sidelight, borrowed lite.
- 3. Factory finishing hollow metal frames and factory machining for hardware.
- 4. Louvers installed in hollow metal doors

- B. Related Sections:

- 1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
- 2. Division 08 Sections "Door Hardware" for door hardware for wood doors and Hollow Metal frames.
- 3. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal frames.

- C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

- 1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
- 2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
- 3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- 4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- 5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
- 6. ANSI/SDI A250.13 - Testing and Rating of Sever Windstorm Resistant Components for Swing Door Assemblies.
- 7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 8. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

9. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Doors Under Specified Pressure Differences Across the Specimens.
10. ASTM E 413 - Classification for Rating Sound Insulation.
11. ANSI/BHMA A156.15 - Hardware Preparation in Steel Doors and Frames.
12. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
13. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel frame supplier in order to prepare the frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 2. Locations of reinforcement and preparations for hardware.
 3. Details of anchorages, joints, field splices, and connections.
 4. Details of accessories.
 5. Details of moldings, removable stops, and glazing.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages 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.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace frames that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective frames.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. CECO Door Products.
 2. Curries Company.
 3. Pioneer Industries.
 4. Steelcraft

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Exterior Masonry Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.

1. Fabricate frames with "closed and tight" miter seams continuously welded on face, finished smooth with no visible face seam.

C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners.

D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
2. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

2.5 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. Sidelight and Transom Bar 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 butt welding.
4. Equal Rabbet Frames: Provide frames with equal rabbet dimensions unless glazing and removable stops require wider dimensions on glass side of frame.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Electrical Thru-Wiring: Provide hollow metal frames receiving electrified hardware with loose wiring harness (not attached to open throat components or installed in closed mullion tubes) and standardized Molex™ plug connectors on one end to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electric through-wire transfer hardware or wiring harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".
9. Electrical Knock Out Boxes: Factory weld 18 gauge electrical knock out boxes to frame for electrical hardware preps; including but not limited to, electric through wire transfer hardware, electrical raceways and wiring harnesses, door position switches, electric strikes, magnetic locks, and jamb mounted card readers as specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".
 - a. Provide electrical knock out boxes with a dual 1/2-inch and 3/4-inch knockouts.
 - b. Conduit to be coordinated and installed in the field (Division 26) from middle hinge box and strike box to door position box.
 - c. Electrical knock out boxes to comply with NFPA requirements and fit electrical door hardware as specified in hardware sets in Division 08 Section "Door Hardware".
 - d. Electrical knock out boxes for continuous hinges should be located in the center of the vertical dimension on the hinge jamb.
10. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
11. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.

- 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
12. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
- D. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.6 STEEL FINISHES

- A. Prime Finishes: frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

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. General Contractor to verify the accuracy of dimensions given to the steel frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 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.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

3.4 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 hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 081113



SECTION 082120 - STILE AND RAIL WOOD DOORS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:

1. Interior stile and rail wood doors with louvered panels.

B. Related Sections include the following:

1. Division 6 Section "Finish Carpentry" for wood door frames.

1.03 SUBMITTALS

A. Product Data: For each type of door. Include details of construction and glazing.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.

C. Product Certificates: Signed by door manufacturers certifying that the products furnished comply with requirements.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain stile and rail wood doors through one source from a single manufacturer.

B. Quality Standard: Comply with the following standard:

1. AWI Quality Standard: AWI's "Architectural Woodwork Quality Standards" for grade of door, construction, finish, and other requirements.



1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's written instructions.

1. Individually package doors in plastic bags or cardboard cartons.

B. Mark each door with individual opening numbers used on Shop Drawings. Use removable tags or concealed markings.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Stile and Rail Doors of Stock Design and Construction:
 - a. Eggers Industries; Architectural Door Division.
 - b. Morgan Manufacturing.
 - c. Simpson Door Company.

2.02 STILE AND RAIL DOORS OF STOCK DESIGN AND CONSTRUCTION

A. Interior Doors: Comply with the following requirements:

1. NWWDA Grade for Opaque Finish: Standard.
2. Wood Species for Opaque Finish: Manufacturer's standard softwood species and cut for stiles and rails; with panels of same species or wood-base construction materials, as standard with manufacturer.
3. Design and Layout: Panel design as described below under NWWDA design group, with minimum dimensions for stiles, rails, panels, and other elements complying with NWWDA I.S.6.



- a. NWWDA Design Group: Bifold Doors.
 - 1) Panel Design: As indicated.
- b. NWWDA Design Group: Louver Doors.
 - 1) Panel Design: As indicated.

Design to match existing and per door elevations sheet A4.0.

2.03 FABRICATION

- A. Fabricate stile and rail wood doors in sizes indicated for Project site fitting.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

- 1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Manufacturer's Written Instructions: Install wood doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or



permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.

D. Field-Finished Doors: Refer to the following for finishing requirements:

1. Division 9 Section "Painting."

3.03 ADJUSTING AND PROTECTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Refinish or replace doors damaged during installation.
- C. Protect doors as recommended by door manufacturer to ensure that wood doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08212

SECTION 08 3313- WOOD OVERHEAD COILING DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood overhead coiling doors.
 - 2. Electrical operators.

- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 08 7100 - Door Hardware.
 - 3. Section 09 9100 - Painting.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Door mounting: Inside mount, with coil and guide rails mounted between opening jambs.
 - 2. Door operation: Electric motor operator on right side of door as viewed from coil side.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate opening sizes, jamb, sill, and head conditions, and motor, and power source locations.
 - 2. Product Data: Manufacturer's descriptive literature for door units, hardware, and operators.
 - 3. Samples:
 - a. Color chips illustrating manufacturer's full range of available colors and finishes.
 - b. After color selection submit Minimum 8 inch long curtain slats showing species, grain, and finish.

- B. Closeout Submittals:
 - 1. Operation and Maintenance Data.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Primary products supplied by single manufacturer with minimum 5 years documented experienced in fabrication of coiling wood doors.
- B. Installer Qualifications: Minimum 2 years documented experience in work of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver doors until proper protection can be provided, and until needed for installation.
- B. Store products in manufacturer's unopened packaging until ready for installation.

1.6 PROJECT CONDITIONS

- A. Maintain temperature and humidity within manufacturer's recommended limits.
- B. Do not install products under environmental conditions outside manufacturer's limits.

1.7 WARRANTIES

- A. Provide manufacturer's standard limited warranty against manufacturing defects.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract Documents are based on products by Woodfold Mfg., Inc.
(www.woodfold.com)
Woodfold Manufacturing, Inc.
1811 18th Avenue
Forest Grove, Oregon 97116 USA
503.357.7181
- B. Overhead Door Company- Wood Counter Door 665
Contact- www.overheaddoor.com (800) 929-3667

2.2 COMPONENTS

- A. Curtain:
 - 1. Slats: Solid hardwood profiles with long edges rabbeted to interlock to form sight-proof curtain.
 - 2. Bottom rail: Solid wood profile matching grain and species of slat.

3. Wood species: Walnut or Birch.
 4. Interlocking hardware: Manufacturer's standard, concealed within slat and bottom rail profile.
- B. Guides: Manufacturer's standard guides for indicated counter door mounting and operation.
- C. Operator: Manual
- D. Guide Spacers: Manufacturer's standard spacers to provide clearance for gear box.
- E. Latching Hardware:
1. Deadbolt with keylock, mortised into curtain bottom rail on coil side of counter door.
 2. Furnish two keys per lock.
- F. Hood: Plywood with veneer on sight-exposed face matching species of curtain material, or solid wood of same species as curtain material; concealed fastener construction to facilitate hood removal for servicing counter door.
- G. Fascia: Plywood veneer on sight-exposed face matching species of curtain materials; concealed fastener attachment to facilitate fascia removal for servicing counter door.

2.3 FINISHES

- A. Factory finish doors after fabrication.
- B. Sand sight-exposed wood surfaces to smooth finish.
- C. Finish: Apply clear water-reducible acrylic lacquer to sight-exposed wood surfaces.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install door assembly in accordance with manufacturer's instructions.
- B. Anchor to adjacent construction without distortion or stress.
- C. Fit and align door assembly including hardware, level and plumb, to provide smooth operation.
- D. Make connections between power supply, operator, and controls as specified in Electrical.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

3.2 ADJUSTING

- A. Adjust doors for smooth operation throughout full operating range.

END OF SECTION

SECTION 084113 - ALUMINUM FRAMED ENTRANCES AND STOREFRONT

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. Exterior storefront framing.
 - 2. Storefront framing for punched openings.
 - 3. Exterior and interior manual-swing entrance doors and door-frame units.

1.3 DEFINITIONS

- A. ADA/ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disability Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities."

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
 - 1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
 - 2. Dimensional tolerances of building frame and other adjacent construction.
 - 3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Glazing-to-glazing contact.
 - e. Noise or vibration created by wind and by thermal and structural movements.
 - f. Loosening or weakening of fasteners, attachments, and other components.

- g. Sealant failure.
 - h. Failure of operating units.
- B. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Structural Loads:
 - 1. Wind Loads: [As indicated on Drawings.] <Insert loads>.
 - a. Basic Wind Speed: 110 mph
 - b. Importance Factor: 1
 - c. Exposure Category: C
 - 2. Seismic Loads: As indicated on Drawings
 - 3. Blast Loads: No Hurricane wind borne debris protection required.
- D. Deflection of Framing Members:
 - 1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed $L/175$ 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 (19 mm), whichever is less.
 - 2. Deflection Parallel to Glazing Plane: 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 directly below them to less than 1/8 inch and clearance between members and operable units directly below them to less than 1/16 inch
- E. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:
 - 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity, but not fewer than 10 seconds.
- F. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. of fixed wall area 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: Provide aluminum-framed systems 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. Water Penetration under Dynamic Pressure: Provide aluminum-framed systems that do not evidence water leakage through fixed glazing and framing areas when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..
 - 1. Maximum Water Leakage: No uncontrolled water penetrating aluminum-framed systems or water appearing on systems' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters that is drained to exterior and water that cannot damage adjacent materials or finishes.
- I. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation 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.
 - 2. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to 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
 - 3. Interior Ambient-Air Temperature: 75 deg F
- J. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 45 when tested according to AAMA 1503.
- K. Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having an average U-factor of not more than 0.57 Btu/sq. ft. x h x deg F when tested according to AAMA 1503.
- L. Structural Sealant: Capable of withstanding tensile and shear stresses imposed by aluminum-framed systems 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.
- M. Structural-Sealant Joints: Designed to produce tensile or shear stress of less than 20 psi

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum-framed systems.
- B. Shop Drawings: For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Include details of provisions for system expansion and contraction and for drainage of moisture in the system to the exterior.
 - 2. For entrance doors, include hardware schedule and indicate operating hardware types, functions, quantities, and locations.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Other Action Submittals:
 - 1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.
- F. Delegated-Design Submittal: For aluminum-framed systems 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. Detail fabrication and assembly of aluminum-framed systems.
 - 2. Include design calculations.
- G. Qualification Data: For qualified Installer.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for aluminum-framed systems, indicating compliance with performance requirements. Testing may be for comparative units with stresses and dimensions equal to or greater than those to be installed per construction documents.
- I. Maintenance Data: For aluminum-framed systems to include in maintenance manuals.
- J. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Engineering Responsibility: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. 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. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 1. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.
- D. Accessible Entrances: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
- E. Source Limitations for Aluminum-Framed Systems: Obtain from single source from single manufacturer.
- F. Structural-Sealant Glazing: Comply with ASTM C 1401, "Guide for Structural Sealant Glazing" for design and installation of structural-sealant-glazed systems.
- G. Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.
- H. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code - Aluminum."
- I. Pre-installation Conference: Conduct conference at Project site

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems 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 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 through fixed glazing and framing areas.
 - f. Failure of operating components.
 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes do not comply with requirements or that fail in materials or workmanship within specified warranty period. Warranty does not include normal weathering.
1. Warranty Period: 20 years from date of Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Entrance Door Hardware:
1. 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 entrance door hardware.
 2. Initial Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of entrance door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper entrance door hardware operation at rated speed and capacity. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide or comparable product by one of the following:

1. Kawneer (An Alcoa Company)
EnCORE Thermal Framing System
#17 Clear Anodized Aluminum
AA-M12C22A31

Kawneer Company Inc.
Technology Park Atlanta
555 Guthridge Court
Norcross, GA 30092
404-731-0046
Contact: Brad Sinclair

2.2 MATERIALS

- A. Aluminum: Alloy and temper recommended 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.
 4. Structural Profiles: ASTM B 308/B 308M.
 5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.
- B. Steel Reinforcement: 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 according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.3 FRAMING SYSTEMS

- A. Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 1. Construction: Thermally broken
 2. Glazing System: Retained by structural sealant at vertical edges and mechanically with gaskets at horizontal edges
 3. Glazing Plane: Multi-plane
- B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.

- C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding 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. Provide matching caps to cover screw heads.
- D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123/A 123M or ASTM A 153/A 153M.
- E. Concealed Flashing: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding flashing compatible with adjacent materials
- F. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.
 - 1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 GLAZING SYSTEMS

- A. Glazing: As specified in Division 08 Section "Glazing."
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
 - 1. Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
 - a. Provide sealants for use inside of the weatherproofing system that have a VOC content of 100 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - b. Color: As selected by Architect from manufacturer's full range of colors.

2. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
 - a. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - b. Color: Matching structural sealant.

2.5 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
 1. Door Construction: 2-inch - overall thickness, with minimum 0.188-inch- overall thickness, 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: As indicated
 - a. Accessible Doors: Smooth surfaced for width of door in area within 10 inches above floor or ground plane.
 3. Glazing Stops and Gaskets: Square snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide non-removable glazing stops on outside of door.
- B. Entrance Door Hardware: As specified in Division 08 Section "Door Hardware."

2.6 ENTRANCE DOOR HARDWARE

- A. General: Provide entrance door hardware as specified in Section "Door Hardware".

ACCESSORY MATERIALS

- B. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants."

1. Provide sealants for use inside of the weatherproofing system that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

FABRICATION

- C. Form or extrude aluminum shapes before finishing.
- D. 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 de-scaling or grinding.
- E. Framing Members, General: 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. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system 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.
 6. Provisions for field replacement of glazing from interior
 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- F. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- G. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At exterior doors, provide compression weather stripping at fixed stops.
 2. At interior doors, provide silencers at stops to prevent metal-to-metal contact. Install three silencers on strike jamb of single-door frames and two silencers on head of frames for pairs of doors.
- H. 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.
- I. 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.

- J. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.7 ALUMINUM FINISHES

- A. Dark Bronze Finish: AAMA 611, AA-M12C22A31, Class II, 0.010 mm or thicker.

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:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
6. Seal joints watertight unless otherwise indicated.

- B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or applying sealant or tape, or by installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

- C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

- D. Set continuous sill members and flashing in full sealant bed as specified in Division 07 Section "Joint Sealants" to produce weather tight installation.

- E. Install components plumb and true in alignment with established lines and grades, and without warp or rack.

- F. Install glazing as specified in Division 08 Section "Glazing."

- G. Entrance Doors: Install 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 according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- H. Install perimeter joint sealants as specified in Division 07 Section "Joint Sealants" to produce weathertight installation.

3.3 ERECTION TOLERANCES

- A. Install aluminum-framed systems to comply with the following maximum erection tolerances:
 - 1. Location and Plane: Limit variation from true location and plane to 1/8 inch in 12 feet over total length.
 - 2. Alignment:
 - a. Where surfaces abut in line, limit offset from true alignment to 1/16 inch
 - b. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch
- B. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch

3.4 ADJUSTING

- A. Adjust operating entrance door hardware to function smoothly as recommended by manufacturer.
 - 1. For entrance doors accessible to people with disabilities, adjust closers to provide a 3-second closer sweep period for doors to move from a 70-degree open position to 3 inches from the latch, measured to the leading door edge.

END OF SECTION 084113

PART 1 - SECTION 08 5200 – ALUMINUM CLAD WOOD WINDOWS

PART 2 - GENERAL

2.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

2.2 SUMMARY

- A. This Section includes fixed wood-framed windows of the following type:

Aluminum clad to match existing

2.3 DEFINITIONS

- A. Performance class designations according to AAMA/WDMA 101/I.S.2/NAFS:

AW: Architectural.
HC: Heavy Commercial.
C: Commercial.
LC: Light Commercial.
R: Residential.

- B. Performance grade number according to AAMA/WDMA 101/I.S.2/NAFS:

Design pressure number in pounds force per square foot used to determine the structural test pressure and water test pressure.

- C. Structural Test Pressure: For uniform load structural test, is equivalent to 150 percent of the design pressure.
- D. Minimum Test Size: Smallest size permitted for performance class (gateway test size). Products must be tested at minimum test size or at a size larger than minimum test size to comply with requirements for performance class.

2.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, fabrication methods, dimensions of individual components and profiles, hardware, finishes, and operating instructions for each type of wood window indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other work, operational clearances, installation details, and the following:

- Mullion details, including reinforcement and stiffeners.
- Joinery details.
- Expansion provisions.
- Flashing and drainage details.
- Weather-stripping details.
- Glazing details.
- Window cleaning provisions.

- C. Samples for Initial Selection: For units with factory-applied color finishes.

- Include similar Samples of hardware and accessories involving color selection.

- D. Samples for Verification: For wood windows and components required, prepared on Samples of size indicated below.

- Main Framing Member: 12-inch- long, full-size sections of window frame.
- Window Corner Fabrication: 12--by-12-inch- long, full-size window corner including full-size sections of window frame with factory-applied color finish, weather stripping, and glazing.
- Hardware: Full-size units with factory-applied finish.
- Weather Stripping: 12-inch- long sections.

- E. Product Schedule: For wood windows. Use same designations indicated on Drawings.
- F. Qualification Data: For Installer, manufacturer and professional engineer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed within the last four years by a qualified testing agency for each type of wood window. The size shall be at least as large as the largest unit of each type in the project.
- H. Maintenance Data: For operating hardware weather stripping and finishes to include in maintenance manuals.

- I. Warranty: Special warranty specified in this Section.

2.5 QUALITY ASSURANCE

- A. Installer Qualifications: An installer acceptable to wood window manufacturer or supplier for installation of units required for this Project.
- B. Manufacturer Qualifications: A manufacturer capable of fabricating wood windows that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.
- C. Source Limitations: Obtain wood windows through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of wood windows. Refer to Division 1 Section "Product Requirements." Do not modify size and dimensional requirements.

Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

- E. Fenestration Standard: Comply with AAMA/WDMA 101/I.S.2/NAFS, "North American Fenestration Standard Voluntary Performance Specification for Windows, Skylights and Glass Doors," for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

Provide WDMA-certified wood windows with an attached label.

- F. Glazing Publications: Comply with published recommendations of glass manufacturers and with GANA's "Glazing Manual" unless more stringent requirements are indicated.

2.6 PROJECT CONDITIONS

- A. Field Measurements: Verify wood window openings by field measurements before fabrication and indicate measurements on Shop Drawings.

Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating wood windows without field measurements. Coordinate wall construction to ensure that actual opening dimensions correspond to established dimensions.

2.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace wood windows that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

- Failure to meet performance requirements.
- Structural failures including excessive deflection, water leakage, or air infiltration.
- Deterioration of wood, metals, vinyl, other materials, and finishes beyond normal weathering.
- Failure of insulating glass.

Warranty Period:

- Window: Ten years from date of Substantial Completion.
- Insulating Glass: Twenty years from date of Substantial Completion.
- Metal Finish (Fluoropolymer - 70% Kynar 500®): Twenty years from date of Substantial Completion.

PART 3 - PRODUCTS

3.1 MANUFACTURERS

- A. Basis-of-Design Product: The basis-of-design for wood windows is Pella Corporation Architect Series®. Subject to compliance with requirements, provide the specified product or a comparable product by one of the following:

Aluminum-Clad Wood Windows:

- Marvin Windows and Doors.
- Weather Shield Mfg., Inc.

3.2 MATERIALS

- A. Wood: Clear ponderosa pine or another suitable fine-grained lumber; kiln dried to a moisture content of 6 to 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch deep by 2 inches wide; water-repellent preservative treated.
- B. Aluminum Extrusions and Rolled Aluminum for Cladding: Manufacturer's standard formed sheet or extruded-aluminum cladding, mechanically bonded to exterior exposed wood members. Provide aluminum alloy and temper recommended by wood window manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength, and not less than 16,000-psi minimum yield strength.

High-Performance Organic Finish for Coil: Manufacturer's standard high performance finish complying with AAMA 620 and paint manufacturer's written specifications for cleaning, conversion coating, and painting.

Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with the performance requirements of AAMA 2605.

Color and Gloss: Custom color to match Architect's sample.

- C. Wood Trim: Material and finish to match frame members. See drawings for details on interior and exterior trim.
- D. Fasteners: Aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by manufacturer to be noncorrosive and compatible with wood window members, cladding, trim, hardware, anchors, and other components.

Exposed Fasteners: Unless unavoidable for applying hardware, do not use exposed fasteners. For application of hardware, use fasteners that match finish of member or hardware being fastened, as appropriate.

- E. Anchors, Nail Fins, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.
- F. Reinforcing Members: Aluminum, or nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

Weather-Stripping Material: Dual weather stripping, consisting of continuous, flexible polyvinyl chloride material in dual durometer design. Vent units have welded corners, compressed between frame and sash for positive seal on all four sides. Secondary polyvinyl chloride leaf-type weather strip between edge of sash and frame.

Weather Seals: Provide weather stripping with integral barrier fin or fins of semirigid, polypropylene sheet or polypropylene-coated material. Comply with AAMA 701/702. May use combination vapor barrier/sheathing tape system as recommended by sheathing manufacturer.

G. Replaceable Weather Seals: Comply with AAMA 701/702.

3.3 WINDOW- See sheet A5.1- Applies to all exterior windows.

A. Window Type: Casement, Fixed as is indicated on Drawings.

B. AAMA/WDMA Performance Requirements: Provide wood windows of performance indicated that comply with AAMA/WDMA 101/I.S.2/NAFS.

Performance Class and Grade: C 40. Verify performance requirements required by local codes with manufacturer's engineer as part of the design submittal.

C. Thermal Transmittance: Provide wood windows with a whole-window, U-factor maximum indicated at 15-mph exterior wind velocity and winter condition temperatures when tested according to NFRC 100.

U-Factor: 0.35 Btu/sq. ft. x h x deg F or less.

D. Solar Heat-Gain Coefficient (SHGC): Provide wood windows with a whole-window SHGC maximum of 0.40, determined according to NFRC 200 procedures.

E. Windborne-Debris Resistance: Provide glazed windows capable of resisting impact from windborne debris, based on the pass/fail criteria as determined from testing glazed windows identical to those specified, according to ASTM E 1886 and testing information in ASTM E 1996 or AAMA 506 and requirements of authorities having jurisdiction. Protection appropriate for 110 mph wind zones.

3.4 GLAZING- Exterior Wood Windows (See Division 8 Section "Glazing" for glass in interior wood doors and miscellaneous glass.)

- A. Glass and Glazing Materials: Refer to Division 8 Section "Glazing" for glass units and glazing requirements applicable to glazed wood window units.
- B. Glass See Sheet A5.1 for further information: Gray tint, insulating-glass units, with low-E coating sputtered on third surface, complying with Division 8 Section "Glazing."
- C. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal and complies with requirements for windborne-debris resistance.

3.5 ACCESSORIES

- A. Dividers (Permanent Muntins): Provide dividers in designs indicated for each sash lite, two per sash with no between-the-glass spacer.

Exterior Material: Extruded, aluminum.

Interior Material: Unfinished wood.

Design: See window elevation details Sheet A5.1.

Exterior Color: As selected by architect from manufacturer's full range.

Interior Color: Unfinished- to be stained per Division 09 Section "Staining and Transparent Finishing".

Width: 7/8 inch and 2 inches- See window elevation details Sheet A5.1 for locations and dimensions..

3.6 FABRICATION

- A. Fabricate wood windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Factory machine windows for openings and for hardware that is not surface applied.
- C. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, as indicated. Provide mullions and cover plates capable of withstanding design loads of window units.
- D. Factory-Glazed Fabrication: Except for light sizes in excess of 100 united inches, glaze wood windows in the factory where practical and possible for applications

indicated. Comply with requirements in Division 8 Section "Glazing" and with AAMA/WDMA 101/I.S.2/NAFS.

Clear pine head and seat boards.

Exterior head and sill casings and trim.
Support brackets.

- E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

3.7 INTERIOR WOOD FINISHES

- A. Unfinished interior wood ready for field applied stain and sealer.

PART 4 - EXECUTION

4.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate, and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.

Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches of opening.

Proceed with installation only after unsatisfactory conditions have been corrected.

4.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.

- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Install windows to be weather-tight..
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action (dissimilar materials, treated lumber, etc.) at points of contact with other materials.
- E. For fin method of attachment, integrate window system installation with exterior weather-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with weather-resistant barrier using watershed principles in accordance with window manufacturer's instructions.
- F. Place interior seal around window perimeter using insulating foam sealant to maintain continuity of building thermal and air barrier.
- G. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.
- H. Leave window units closed and locked.

4.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- D. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.

END OF SECTION 08 5200



SECTION 087100 - DOOR HARDWARE

Note: CM to hold on site Pre-Construction meeting prior to installation of new HC threshold at Ex. Lobby 127 to discuss the best way to reduce the transition from Lobby to existing stair landing.

GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes commercial door hardware for the following:

Swinging doors.

Door hardware includes, but is not necessarily limited to, the following:

Mechanical door hardware.
Electromechanical door hardware.
Automatic operators.

Related Sections:

Division 08 Section "Hollow Metal Doors and Frames".
Division 08 Section "Stile And Rail Wood Doors".
Division 08 Section "Aluminum-Framed Entrances and Storefronts".
Division 28 Section "Access Control Hardware Devices".

Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

ANSI A117.1 - Accessible and Usable Buildings and Facilities.
ICC/IBC - International Building Code.
NFPA 70 - National Electrical Code.
NFPA 80 - Fire Doors and Windows.
NFPA 101 - Life Safety Code.
NFPA 105 - Installation of Smoke Door Assemblies.
UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
State Building Codes, Local Amendments.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

ANSI/BHMA Certified Product Standards - A156 Series.
UL10C - Positive Pressure Fire Tests of Door Assemblies.
UL 305 - Panic Hardware.

SUBMITTALS

Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

Content: Include the following information:

- Type, style, function, size, label, hand, and finish of each door hardware item.
- Manufacturer of each item.
- Fastenings and other pertinent information.
- Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
- Explanation of abbreviations, symbols, and codes contained in schedule.
- Mounting locations for door hardware.
- Door and frame sizes and materials.
- Warranty information for each product.

Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

Shop Drawings: Details of electrified access control hardware indicating the following:

Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.

Complete (risers, point-to-point) access control system block wiring diagrams.
Wiring instructions for each electronic component scheduled herein.

Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

Informational Submittals:

Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

QUALITY ASSURANCE

Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

DELIVERY, STORAGE, AND HANDLING

Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

COORDINATION

Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

WARRANTY

General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

Structural failures including excessive deflection, cracking, or breakage.
Faulty operation of the hardware.
Deterioration of metals, metal finishes, and other materials beyond normal weathering.
Electrical component defects and failures within the systems operation.

Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

Special Warranty Periods: One year from date of substantial completion.

PRODUCTS

SCHEDULED DOOR HARDWARE

General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

HANGING DEVICES

Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

Quantity: Provide the following hinge quantity:

Two Hinges: For doors with heights up to 60 inches.

Three Hinges: For doors with heights 61 to 90 inches.

Four Hinges: For doors with heights 91 to 120 inches.

For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.

Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

Hinge Options: Comply with the following:
Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
Provide 1/4" radius corners for hinges used on aluminum doors and frames.

Manufacturers:

Bommer Industries (BO).
McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
Stanley Hardware (ST).

DOOR OPERATING TRIM

Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.

Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.

Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

Manufacturers:

Burns Manufacturing (BU).
Hiawatha, Inc. (HI).
Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

CYLINDERS AND KEYING

General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

Threaded mortise cylinders with rings and cams to suit hardware application.
Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
Tubular deadlocks and other auxiliary locks.
Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
Keyway: Manufacturer's Standard.

Patented Cylinders: ANSI/BHMA A156.5, Grade 1 Certified Products Directory (CPD) listed cylinders employing a utility patented and restricted keyway requiring the use of a patented key. Cylinders are to be protected from unauthorized manufacture and distribution by manufacturer's United States patents. Cylinders are to be factory keyed with owner having the ability for on-site original key cutting.

Manufacturers:

Sargent (SA) - XC.
No Substitution.

Keying System: Each type of lock and cylinders to be factory keyed.

Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
New System: Key locks to a new key system as directed by the Owner.

Key Quantity: Provide the following minimum number of keys:

Change Keys per Cylinder: Two (2)
Master Keys (per Master Key Level/Group): Five (5).
Construction Keys (where required): Ten (10).

Construction Keying: Provide construction master keyed cylinders.

Key Registration List (Bitting List):

Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
Provide transcript list in writing or electronic file as directed by the Owner.

MECHANICAL LOCKS AND LATCHING DEVICES

Multi-Point Locksets: ANSI/BHMA A156.37, Certified Products Directory (CPD) listed vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual mounted outside lever trim controls available in a variety of ANSI/BHMA operational functions. Option for single top latching only eliminates the need for bottom strikes.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Manufacturers:

Sargent Manufacturing (SA) - 7000 Series.
No Substitution.

Cylindrical Locksets, Grade 2 (Standard Duty): ANSI/BHMA A156.2, Series 4000, Grade 2 Certified Products Directory (CPD) listed.

Locks are to be non-handed and fully field reversible.

Manufacturers:

Sargent Manufacturing (SA) - 7 Line.
No Substitution.

LOCK AND LATCH STRIKES

Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.

Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.

Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

Standards: Comply with the following:

Strikes for Mortise Locks and Latches: BHMA A156.13.

Strikes for Bored Locks and Latches: BHMA A156.2.

Strikes for Auxiliary Deadlocks: BHMA A156.36.

Dustproof Strikes: BHMA A156.16.

CONVENTIONAL EXIT DEVICES

General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices

with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.

Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.

Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.

Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

Rail Sizing: Provide exit device rails factory sized for proper door width application.

Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

Manufacturers:

Sargent Manufacturing (SA) - 80 Series.
No Substitution.

1.1 STAND ALONE ELECTRONIC ACCESS CONTROL EXIT DEVICES

Stand Alone Integrated Access Control Exit Devices: Internal, battery-powered, self-contained ANSI A156.3, Grade 1 electronic exit device consisting of complete door trim unit with electronically motor driven locking mechanism, integrated keypad, proximity card reader, or keypad/proximity reader combination, and specified electronic programming accessories. Trim to accept standard, interchangeable (removable) core, security and high security override cylinders. Provide keypad/proximity and proximity



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

only products with a minimum of 2,000 user codes, low-battery detection and warning, LED status indicators, and ability to program at the device for the functions indicated.

Manufacturers:

Sargent Manufacturing (SA) - Profile v.G1 Series.
No Substitution.

Stand Alone Electronic Keypad Exit Devices: Internal, battery-powered, self-contained ANSI/BHMA A156.3 Grade 1 certified panic and fire exit hardware consisting of electronically motor driven locking mechanism and integrated keypad without requirements for separate electronic programming devices. Exit devices to accept standard, interchangeable (removable) core, security and high security override cylinders. Provide keypad locks with a minimum 100 user codes furnished standard with 6 "AA" batteries and non-volatile memory.

Manufacturers:

Sargent Manufacturing (SA) - KP80 Series.
No Substitution.

DOOR CLOSERS

All door closers specified herein shall meet or exceed the following criteria:

General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.

Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

Manufacturers:

Sargent Manufacturing (SA) - 1431 Series.
No Substitution.

LOW ENERGY OPERATORS

American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).

ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.

ANSI/ BHMA A156.19 Standards for Power Assist and Low Energy Power Operated Doors.

Underwriters Laboratories (UL).

UL Listed R-9469 Fire Door Operator with Automatic Closer.

UL 325 Standard for Safety for Door, Drapery, Gate, Louver and Window Operators and Systems.

UL991 Listed - Tests for Safety-Related Controls Employing Solid-State Device.

Materials

Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, as indicated below:

Extruded Aluminum, Alloy 6063-T5.

Model: Ditec Entrematic HA9 low energy automatic door operator:

Reference Standard: ANSI/BHMA A156.19.

Configuration: Operator to control single swinging doors and pairs of swinging doors as indicated on the drawings and specified below:

- a. Traffic Pattern: Two Way, Pairs of Doors, Simultaneous swing.
3. Automatic Door Operator: Electro-mechanical, non-handed operator, powered by 24 volt, 1/8 hp motor. Spring shall be adjustable to compensate for different manual push forces required on varying door widths.
Automatic operator shall be capable of operating and controlling up to a 200 pound (91 kg) door, 48 inches (1219 mm) in width.
Surface Mounted Operator:
 4. Side Access Operator Housing: Operator is contained in 5-1/8" (130.2 mm) deep x 4 5/16" (110 mm) high extruded aluminum housing with a removable cover.
 5. Surface Mounted Housing: [Standard Width.] [Continuous for full width of door.]

6. Connecting Hardware: Surface mounted operators to have a steel arm from the operator, mounted to the top face of the swing door.
 7. UL Listed R-9469 Fire Door Operator with Automatic Closer (surface mounted operator).
 - B. Operator Temperature Range: Capable of operating within temperature ranges of -20°F (-29°C) and 160°F (71°C).
 - C. Electrical Characteristics: Nominal current draw 75 watts (.625 amps at 120 VAC), built-in thermal overload protection.
 - D. [Battery Convenience Mode: Operator to maintain continuous operation by battery power during power failure. Battery is continuously monitored and provides a warning signal if the battery is not working properly.]
 - E. [Digital Cycle Counter: Battery powered, 7 digit LCD cycle counter with a reset feature to track door usage cycles.]
- 1.2 Door Operation:
- A. Opening Cycle: The adjustable speed operator shall control the door opening to the back check position, where the opening speed is reduced.
 1. Manual door operation with operational forces of 15 lbf maximum to fully open the door applied at 1" (25 mm) from the latch edge of the door.
 - B. Hold Open: The operator shall stop and hold the door open at the selected door opening angle for an adjustable period of time (1.5 seconds to 30 seconds).
 - C. Closing Cycle: Power closing shall be provided by means of clock spring and motor. The door will slow to low speed at latch check before it reaches the fully closed position.
 - D. Electronic Dampening: Operator to include standard electric dampening system which automatically counteracts additional forces applied to the door during the opening or closing cycle by reducing door speed.
 - E. Stack Pressure Compensation: Electronic control allows for increases of forces to overcome minor stack pressures while compensating to lower manual push forces when the door is used in manual mode in order to comply with ANSI/BHMA A156.19.
 - F. Obstruction Control: The operator will stop and reverse the door movement.
 - G. Astragal Coordinator: Sequenced electronic operation between operators for pairs of doors allowing astragal coordination.
 - H. Lock Retry Circuit: If attempt to fully close the door is unsuccessful, the operator will automatically reverse open 10 degrees and reclose in an attempt to successfully close the door.
 - I. Electronic Controls: Microprocessor controlled unit shall control the operation and switching of the swing power operator. The microprocessor unit provides low voltage power supply for all means of actuation. The controls include time delay (1.5 to 30 seconds) for normal cycle.
 - J. Control Switch: Automatic door operators shall be equipped with the following type of multi-position function switch:
 1. 3 position rocker switch mounted on end cap (On-Off-Hold).

DOOR STOPS AND HOLDERS

General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

Manufacturers:

Burns Manufacturing (BU).
Hiawatha, Inc. (HI).
Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

Manufacturers:

Rixson Door Controls (RF).
Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
Sargent Manufacturing (SA).

ARCHITECTURAL SEALS

General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

Provide smoke labeled perimeter gasketing at all smoke labeled openings.

Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

Manufacturers:

National Guard Products (NG).
Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
Reese Enterprises, Inc. (RE).

FABRICATION

Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

FINISHES

Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

EXECUTION

EXAMINATION

Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

PREPARATION

Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.



Wood Doors: Comply with ANSI/DHI A115-W series.

INSTALLATION

Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."

Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

Power Operator products and accessories are required to be installed through current members of the manufacturer's "Power Operator Preferred Installer" program.

Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install 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 specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

FIELD QUALITY CONTROL

Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.



Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

ADJUSTING

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.

CLEANING AND PROTECTION

Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

Clean adjacent surfaces soiled by door hardware installation.

Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

DEMONSTRATION

Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

DOOR HARDWARE SETS

The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should 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 and functionality.

Quantities listed are for each pair of doors, or for each single door.

The supplier is responsible for handling and sizing all products.

Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

Hardware Sets

See Door Schedule Sheet A4.0.

Construction Manager and hardware sub to provide final Hardware Schedule for approval.

END OF SECTION 087100



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

SECTION 088000 - 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 glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Exterior Windows and Doors
 - 2. Interior Windows and Doors

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 according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit.

1.4 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 the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass.

- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for tinted glass, coated glass, insulating glass, glazing sealants and glazing gaskets.
 - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- E. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- E. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
- F. Safety Glazing Labeling: Where safety glazing labeling 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.
- G. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.8 PROJECT 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 (4.4 deg C).

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass 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 on Insulating Glass: Manufacturer's standard form in which 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 the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

- A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
 - 1. Minimum Glass Thickness for Exterior Lites: As needed to meet wind load requirements.
 - 2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
- B. Strength: Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

- C. 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 6.0 mm thick or as required by wind loads.
 2. For laminated-glass lites, properties are based on products of construction indicated.
 3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 4. 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
 5. 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.
 6. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
1. Sealing System: Dual seal, with manufacturer's standard primary and secondary.
 2. Spacer: Manufacturer's standard spacer material and construction
 3. Desiccant: Molecular sieve or silica gel, or blend of both.

2.3 GLAZING GASKETS

- A. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

2.4 GLAZING SEALANTS

- A. General:
1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will 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. VOC Content: For sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D.
 4. 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 100/50, Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dow Corning Corporation; 790.
 - b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
 - c. May National Associates, Inc.; Bondaflex Sil 290.
 - d. Pecora Corporation; 890.
 - e. Sika Corporation, Construction Products Division; SikaSil-C990.
 - f. Tremco Incorporated; Spectrem 1.

2.5 GLAZING TAPES

- A. 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 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.6 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of 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: 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 glass manufacturer to maintain glass lites in place for installation indicated.

- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.7 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.
- 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 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. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- 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 according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- K. 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.
- L. 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.

3.3 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 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 by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

3.4 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.

3.5 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. 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; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass 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 glass as recommended in writing by glass manufacturer.

END OF SECTION 088000



SECTION 09 1110 - NON-LOAD BEARING STEEL FRAMING

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. Non-load-bearing steel framing systems for interior gypsum board assemblies.
 - 2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

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 E 119 by an independent testing agency.

2.2 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: hot-dip galvanized unless otherwise indicated.
- B. Studs and Runners: ASTM C 645. Use either steel studs and runners
 - 1. Steel Studs and Runners:
 - a. Minimum Base-Metal Thickness: As indicated on Drawings

- b. Depth: As indicated on Drawings
- C. Slip-Type Head Joints: Where indicated, provide **one of** the following:
 - 1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
- D. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the 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.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire Trak Corp.; Fire Trak System attached to studs with Fire Trak Posi Klip.
 - b. Grace Construction Products; FlameSafe FlowTrak System.
 - c. Metal-Lite, Inc.; The System.
 - d. Steel Network Inc. (The); VertiClip SLD
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base-Metal Thickness: 0.027 inch
- F. Cold-Rolled Channel Bridging: Steel, 0.053-inch minimum base-metal 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 thick, galvanized steel.
- G. Hat-Shaped, Rigid Furring Channels: ASTM C 645.
 - 1. Minimum Base-Metal Thickness: 0.033 inch
 - 2. Depth: 7/8 inch
- H. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
 - 1. Configuration: Asymmetrical or hat shaped
- I. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches ,wall attachment flange of 7/8 inch minimum uncoated-metal thickness of 0.018 inch, and depth required to fit insulation thickness indicated.



2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

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 runners (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 required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.

2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
 3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
 4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- C. Install bracing at terminations in assemblies.
- D. 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: 24 inches o.c. unless otherwise indicated.
 2. Multilayer Application: 24 inches o.c. 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 (runners) 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 penetrating 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 runner 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 (13-mm) 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.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

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: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

E. Z-Furring Members:

1. Erect insulation, specified in Division 07 Section "Thermal Insulation," vertically and hold in place with Z-furring members spaced 24 inches o.c.
2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches from corner and cut insulation to fit.

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.

END OF SECTION 092216



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

SECTION 092900 - 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. Tile backing panels.
- B. Related Requirements:
 - 1. Division 09 Section "Tiling" for cementitious backer units installed as substrates for ceramic tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

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 supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, 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, those that are moisture damaged, and those that are 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. Low Emitting Materials: For ceiling and wall assemblies, provide materials and construction identical to those tested in assembly and complying with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.2 GYPSUM BOARD, GENERAL

- A. Recycled Content of Gypsum Panel Products: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 50 percent.
- B. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- C. Regional Materials: Gypsum panel products shall be manufactured within 500 miles of Project site.
- D. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. American Gypsum.
 2. CertainTeed Corp.
 3. Georgia-Pacific Gypsum LLC.
 4. Lafarge North America Inc.
 5. National Gypsum Company.
 6. PABCO Gypsum.
 7. Temple-Inland.
 8. USG Corporation.

- B. Gypsum Wallboard: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch
 - 2. Long Edges: Tapered
- C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch
 - 2. Long Edges: Tapered
- D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
 - 1. Thickness: 1/2 inch
 - 2. Long Edges: Tapered.
- E. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
 - 1. Core: 5/8 inch Type X
 - 2. Long Edges: Tapered.
 - 3. Mold Resistance: ASTM D 3273, score of 10.

2.4 SPECIALTY GYPSUM BOARD

- A. Gypsum Board, Type C: ASTM C 1396/C 1396M. Manufactured to have increased fire-resistive capability.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. American Gypsum; Firebloc Type C.
 - b. CertainTeed Corp.; ProRoc Type C.
 - c. Georgia-Pacific Gypsum LLC; Fireguard C.
 - d. Lafarge North America Inc.; Firecheck Type C.
 - e. National Gypsum Company; Gold Bond Fire-Shield C.
 - f. PABCO Gypsum; Flame Curb Type Super C.
 - g. Temple-Inland; Type TG-C.
 - h. USG Corporation; Firecode C Core.
 - 2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
 - 3. Long Edges: Tapered.

2.5 TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or 1325, with manufacturer's standard edges.
 - 1. Products: Subject to compliance with requirements, provide one of the following:

a. **Georgia Pacific
DensShield Tile Backer**

2. Thickness: 5/8 inch
3. Mold Resistance: ASTM D 3273, score of 10.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - d. Expansion (control) joint.
 - e. Curved-Edge Cornerbead: With notched or flexible flanges.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

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 setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.8 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 - 1. Laminating adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. 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.
- D. Thermal Insulation: As specified in Division 07 Section "Thermal Insulation."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- 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, except floors. 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.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 - 1. **As indicated on Drawings**
- 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. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. 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. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
 4. Fastening Methods: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 APPLYING TILE BACKING PANELS

- A. Cementitious Backer Units: ANSI A108.11, at vertical locations indicated to receive tile

3.5 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. U-Bead: Use at exposed panel edges.
- D. Aluminum Trim: Install in locations at frameless interior glazing.

3.6 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 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 other Division 09 Sections.
- E. Cementitious Backer Units: Finish according to manufacturer's written instructions.

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 092900

SECTION 09 3100 - PORCELAIN TILE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Porcelain Floor tile- Lobby 104
- 2. Stone thresholds.

B. Related Sections:

- 1. Division 7 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
- 2. Division 9 Section "Gypsum Board" for cementitious backer units.

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 "American National Standard Specifications for Installation of Porcelain Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum Wet ≥ 0.60 Dry ≥ 0.70

1.5 SUBMITTALS

- A. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- B. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Stone thresholds in 6-inch lengths.

1.6 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one 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 one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - 1. Stone thresholds.
 - 2. Joint sealants.
 - 3. Cementitious backer units.

1.7 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.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.8 PROJECT 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 PRODUCTS, GENERAL

- A. ANSI Porcelain 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 unless otherwise indicated.
- 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 TCA 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.
- E. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.2 TILE PRODUCTS

- 1. **See Finish Schedule for Locations**

2.3 THRESHOLDS

- A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.
 - 1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch (1.5 mm) above adjacent floor surface. Finish bevel to match top surface of

threshold. Limit height of threshold to 1/2 inch or less above adjacent floor surface.

- B. Marble Thresholds: ASTM C 503, with a minimum abrasion resistance of 12 per ASTM C 1353 or ASTM C 241 and with honed finish.
 - 1. Description: Uniform, fine- to medium-grained white stone with gray veining.

2.4 SETTING MATERIALS

- A. Latex-Portland Cement Mortar (In Corridors) (Thin Set): ANSI A118.4.
 - 1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 - 2. Provide prepackaged, dry-mortar mix combined with acrylic resin 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.
- B. Water-Cleanable, Tile-Setting Epoxy (In Toilet Rooms): ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F and 212 deg F, respectively, and certified by manufacturer for intended use.
- C. Chemical-Resistant Furan Mortar: ANSI A118.5, with carbon filler.

2.5 GROUT MATERIALS

- A. Water-Cleanable Epoxy Grout: ANSI A118.3.
 - 1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F and 212 deg F, respectively, and certified by manufacturer for intended use.
- B. Grout for PregROUTed Tile Sheets: Same product used in factory to pregROUT tile sheets.

2.6 ELASTOMERIC SEALANTS

- A. General: Provide sealants, primers, backer rods, and other sealant accessories that comply with the following requirements and with the applicable requirements in Division 7 Section "Joint Sealants."
 - 1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Use primers, backer rods, and sealant accessories recommended by sealant manufacturer.
 1. Colors: As selected by Architect from manufacturers full line. Silicone sealant in first paragraph below is suitable for joints in nontraffic surfaces only.
- B. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior porcelain tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
1. Products: Subject to compliance with requirements,:
 - a. DAP Inc.; Titanium Enriched Kitchen and Bath Sealant.
 - b. Dow Corning Corporation; Dow Corning 786.
- C. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.
1. Products: Subject to compliance with requirements,:
 - a. Bostik, Inc.; Chem-Calk 550.
 - b. Degussa Building Systems; Sonneborn Sonolastic SL 2.
 - c. Pecora Corporation; Dynatrol II-SG.

2.7 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. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM D 87.
 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- D. Grout Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.
1. Products: Subject to compliance with requirements,:

- a. Bonsal American; an Oldcastle company; Grout Sealer.
- b. Bostik, Inc.; CeramaSeal Grout & Tile Sealer.
- c. C-Cure; Penetrating Sealer 978.

2.8 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 installed tile.
 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 existing tile flooring to be tiled over is free of defect which may damage new tile once in use.
 - 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 latex modified thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) 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.
- D. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Porcelain Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Porcelain Tile" that are referenced in TCA 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 composed of tiles 8 by 8 inches or larger.
 - c. Tile floors composed 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. 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.
- D. Jointing Pattern: Lay tile as shown on drawings. 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.

E. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:

Match Existing

F. 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.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

G. Stone Thresholds: Install stone thresholds in same type of setting bed as adjacent floor unless otherwise indicated.

1. At locations where mortar bed (thickset) would otherwise be exposed above adjacent floor finishes, set thresholds in latex-portland cement mortar (thin set).
2. Do not extend cleavage membrane or crack isolation membrane under thresholds set in latex-portland cement mortar. Fill joints between such thresholds and adjoining tile set on cleavage membrane or crack isolation membrane with elastomeric sealant.

H. Grout Sealer: Apply grout sealer to cementitious grout joints in tile floors according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.4 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all Porcelain tile surfaces so they are free of foreign matter.

1. Remove epoxy and latex-portland cement 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. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
- B. 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.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.5 INTERIOR TILE INSTALLATION SCHEDULE

- A. Interior Floor Installations, the following is provided for bidding/pricing purposes to show basis of design. Final selections will be made by the Architect from comparable products.

Basis of Design:

Trinity Tile – Milos- Nero Marquina
Trinity Tile
115 S.W. 49th Avenue
Ocala, Florida 34474
www.trinitytile.com
866-774-3390

END OF SECTION 09 3100



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

Division 09 – Finishes

Section 093000 – Tiling

Sub-Section 093019 – Paver Tiling

NOTE TO SPECIFIER: Please review the entire specification before you begin to edit for your specific project requirements. IT IS RECOMMENDED to run a copy of the entire specification, make notes of products that you wish to specify, mark off the items you wish to change or delete first. Then do a “save as” to the original file, renaming it to your specific project name, then make the revisions and deletions to the spec. Save your data at frequent intervals so as to not lose it if you experience software or computer problems. Upon editing this guide specification completely and placing into your project requirements, it is recommended that you delete any non-pertinent sub-sections and eliminate all of the “NOTES TO SPECIFIER”.

DISCLAIMER: This guide specification was written for the sole purpose of being used as such, a guide to create your specific project specifications. We do not accept any responsibility for the accuracy, up to date product data, or the current industry standards listed here as they may have changed since this guide was created. Please get all current product literature for each product you specify, the industry standards that are relative to your installation and all Federal, State and Local codes.

PART 1 - GENERAL

1.1 SUMMARY

1.2 SECTION INCLUDES

- A. Porcelain tile

1.3 PRODUCTS FURNISHED BUT NOT INSTALLED THIS SECTION

NOTE TO SPECIFIER: Edit for applicable products

1.4 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

Section 093019 – Trinity Tile Guide Specification – 093019-- 2

NOTE TO SPECIFIER: Edit for applicable products

1.5 RELATED SECTIONS

1.6 REFERENCE STANDARDS

- A. American National Standards Institute (ANSI) A137.1 American National Standard Specifications For Ceramic Tile – Current Edition

NOTE TO SPECIFIER: edit for applicable reference standards

1.7 SUBMITTALS

- A. Submit samples of each type/style/finish/size/color of ceramic tile, mosaic, paver, trim unit or threshold under provisions of Section (01300.) (01340.)
- B. Submit manufacturers' installation instructions under provisions of Section (01300.) (01340.)
- C. Submit manufacturer's certification under provisions of Section (01405) that the materials supplied conform to ANSI A137.1.
- D. Submit proof of warranty.

1.8 QUALITY ASSURANCE

- A. Tile Manufacturer: Company or Affiliate Company specializing in ceramic tile, mosaics, pavers, trim units and/or thresholds with five (5) years minimum experience. Obtain tile from a single source with resources to provide products of consistent quality in appearance and physical properties.

1.9 MOCK-UPS

- A. Provide mock-up of each type/style/finish/size/color of ceramic tile, mosaics, pavers, trim unit and threshold, along with respective installation adhesives, mortars, grouts and other installation materials, under provisions of Section (01400) (01405).

1.10 PRE-INSTALLATION CONFERENCE

Pre-installation conference: At least three weeks prior to commencing the work attend a meeting at the jobsite to discuss conformance with requirements of specification and job site conditions.

Section 093019 – Trinity Tile Guide Specification – 093019-- 2

Section 093019 – Trinity Tile Guide Specification – 093019-- 3

Representatives of owner, architect, general contractor, tile subcontractor, and any other parties who are involved in the scope of this installation must attend the meeting.

1.11 DELIVERY, STORAGE AND HANDLING

- A. Acceptance at Site: deliver and store packaged materials in original containers with seals unbroken and labels, including grade seal, intact until time of use, in accordance with manufacturer's instructions.
- B. Store porcelain tile and installation system materials in a dry location; handle in a manner to prevent chipping, breakage, and contamination.

NOTES FOR SPECIFIER: Edit for project specific sequence and scheduling

1.17 WARRANTY

1.18 MAINTENANCE

Submit maintenance data under provisions of Section 01730. Include cleaning methods, cleaning solutions recommended, stain removal methods, as well as polishes and waxes recommended.

1.19 EXTRA MATERIALS STOCK

Upon completion of the work of this Section, deliver to the owner 2% minimum additional tile and trim shape of each type, color, pattern and size used in the work, as well as extra stock of adhesives, mortars, grouts and other installation materials for the owner's use in replacement and maintenance. Extra stock to be from same production run or batch as original tile and installation materials.

PART 2 - PRODUCTS

2.1 TILE MANUFACTURERS

Subject to compliance with paragraphs 1.12 and performance requirements, provide products by one of the following manufacturers:

Name: Trinity Tile

Address: 115 SW 49th Ave, Suite 105, Ocala, Florida 34474

Office: 866-774-3390

Fax: 352-369-0410

Email: info@trinitytile.com

Website: www.trinitytile.com

2.3 FLOOR TILING MATERIALS

NOTE TO SPECIFIER: edit for each tile type create a product code for each tile and trim that you wish to use on the project.

Section 093019 – Trinity Tile Guide Specification – 093019-- 4

Tile # PT – 01 - Floors

- A. Tile/Collection:
- B. Color:
- C. Size:
- D. Finish:
- E. Rectified: Yes
- F. Product Number:
- G. Special shapes:
- H. Pattern/Tile Schedule (Dwg):

NOTE TO SPECIFIER: Use either the following performance specification or the proprietary specification.

2.4 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

NOTE TO SPECIFIER: Edit for applicable product.

PART 3 – EXECUTION

3.1 SUBSTRATE EXAMINATION

- A. Verify that surfaces to be covered with ceramic tile, mosaics, pavers, brick, stone, trim or waterproofing are:
 - 1. Sound, rigid and conform to good design/engineering practices;
 - 2. With maximum deflection under all live, dead and impact loads, including concentrated loads, of L/360 for ceramic tile, mosaics, pavers or brick;
 - 3. Clean and free of dust, dirt, oil, grease, sealers, curing compounds, laitance, efflorescence, form oil or loose plaster, paint and scale;
 - 4. Not leveled with gypsum or asphalt based compounds;
 - 5. In accordance with ANSI 108.01 –Subsurfaces and Preparation by Other trades.

3.2 SURFACE PREPARATION

A. CONCRETE SUBSTRATES

(Insert any Special Means of Preparation in addition to the surface preparation requirements listed in § 3.1)

NOTE TO SPECIFIER: edit substrate and preparation section based on project specific surfaces and conditions.

3.3 INSTALLATION – ACCESSORIES

NOTE TO SPECIFIER: edit section based on project conditions.

3.4 INSTALLATION – TILE, BRICK & STONE

- A. **General:** Install in accordance with current versions of American National Standards Institute, Inc. (ANSI) "**A108 American National Standard for Installation of Ceramic Tile**" and TCA "**Handbook for Ceramic Tile Installation both to be the most current version.**" Cut and fit ceramic tile, brick or stone neatly around corners, fittings, and obstructions. Perimeter pieces to be minimum half tile, brick or stone. Chipped, cracked, split pieces and edges are not acceptable. Make joints even, straight, plumb and of uniform width to tolerance +/- 1/16" over 8' (1.5mm in 2.4m). Install divider strips at junction of flooring and dissimilar materials.

3.4 CLEANING

Clean excess mortar/epoxy from veneer surfaces with water before they harden and as work progresses. Do not contaminate open grout/caulk joints while cleaning. Sponge and wash veneers diagonally across joints. Do not use acids for cleaning. Polish with clean dry cloth. Remove surplus materials and leave premises broom clean.

Follow manufacturer's recommendation for protection during installation and grouting as well as recommendations for routine and heavy duty maintenance of porcelain tiles.

3.5 PROTECTION

PART 4 – HEALTH AND SAFETY

The use of personal protection such as rubber gloves, suitable dust masks, safety glasses and industrial clothing is highly recommended. Discarded packaging, product wash and waste water should be disposed of as per local, state or federal regulations.

End of Section 093019 – Paver

milos

thru color porcelain, made in the usa



trinity tile
Inspiring Surface Design

milos

thru color porcelain, made in the usa



calacatta



marfil



amani gray

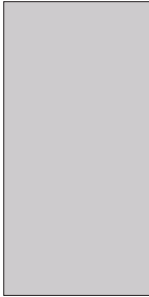

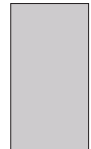





amani bronze



nero marquina

AVAILABLE SIZES

| |  24"x48" |  24"x24" |  12"x24" |  Listello 3"x12" |  Hexagon Mosaic 3"x3 on 9"x11" Sheets |  Bullnose 3 x 12" | |
|---------------|--|--|--|---|---|--|--------------------------------|
| calacatta | ● ▲ | ● ▲ | ● ▲ | ▲ | ● ▲ | ● ▲ | |
| marfil | ● ▲ | ● ▲ | ● ▲ | ▲ | ● ▲ | ● ▲ | |
| amani gray | ● ▲ | ● ▲ | ● ▲ | ▲ | ● ▲ | ● ▲ | |
| amani bronze | ● ▲ | ● ▲ | ● ▲ | ▲ | ● ▲ | ● ▲ | |
| nero marquina | ● ▲ | ● ▲ | ● ▲ | ▲ | ● ▲ | ● ▲ | ● MATTE ▲ RECTIFIED & POLISHED |

NOTE: Rectified and non-rectified cannot be used together in a pattern

TECHNICAL SPECIFICATIONS

| | water absorption | nominal thickness | chemical resistance | stain resistance | breaking strength | frost resistance | scratch hardness | dynamic coefficient of friction |
|---------|------------------|-------------------|---------------------|------------------|-------------------|------------------|------------------|---------------------------------|
| Test | ASTM C-373 | N/A | ASTM C-650 | ASTM C-1378 | ASTM C-648 | ASTM C-1026 | Mohs | ANSI 137.1 |
| Results | ≤ 0.5% | 10mm | Not affected | Not affected | ≥ 400 | Resistant | ≥ 7 | Matte ≥ 0.50 |

ANSI A108.02 Section 4.3.8 Grout joint minimum is 1/8". When installing in running bond/brick joint pattern, a maximum 30% offset is recommended along with 3/16" grout joint.

115 S.W. 49th Avenue, Ocala, Florida 34474 • www.trinitytile.com • 866-774-3390

SECTION 09 5100 - SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Accessories.

1.02 REFERENCES

- A. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings ; 2004.
- B. ASTM C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels ; 2006.

1.03 SUBMITTALS

- A. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- B. Product Data: Provide data on suspension system components and acoustical units.
- D. Samples: Submit three samples, minimum 6 inches by 6 inches, illustrating material and finish of acoustical units.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 PROJECT CONDITIONS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Install acoustical units after interior wet work is dry.

1.05 EXTRA MATERIALS

- A. Provide 3 percent of total acoustical unit area of each type of acoustical unit for Owner's use in maintenance of project.

PART 2 PRODUCTS

2.02 ACOUSTICAL UNITS

- A. Manufacturers; General:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. CertainTeed: www.certainteed.com.
 - 3. USG: www.usg.com.
- B. Substitutions: See Section 01 6000 - Product Requirements.
- C. Acoustical Units (AC1):
 - 1. Acoustical Panel: Painted mineral fiber, ASTM E 1264, Type III, Class A, with the following characteristics determined as specified in ASTM E 1264.

- a. Size: 2'x2'
 - b. Thickness: 3/4"
 - c. Light Reflectance: 0.86
 - d. Noise Reduction Coefficient (NRC): 0.70
 - e. Ceiling Attenuation Class (CAC): 35
2. Products:

ACT 1- General

- a. Acoustical Panel: Basis of Design - Armstrong, Cirrus Angled Tegular, Item #584; Color - White.
- b. Suspension System: Prelude 15/16" Exposed Tee. Color - White.

ACT 2- Commissioners Room and Lobby

- a. Acoustical Panel: Basis of Design - Armstrong, Easy Elegance Shallow Coffered - White. Model # 1282BXA
- b. Suspension System: Prelude 15/16" Exposed Tee. Color - White.

2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
- C. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C 636 and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:240.
- C. Locate system on room axis according to reflected plan.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners in excess of 2 degrees.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
 - 2. Miter corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units with pattern parallel to shortest room axis.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
 - 1. Cut to fit irregular grid and perimeter edge trim.
 - 2. Make field cut edges of same profile as factory edges.
 - 3. Double cut and field paint exposed reveal edges with manufacturer's recommended paint.
- H. Where round obstructions occur, provide preformed closures to match perimeter molding.

3.04 ERECTION TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

END OF SECTION



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set



MODEL #1282BXA

EASY ELEGANCE Shallow Coffe White 24" x 24"



MODEL #1282BXA

EASY ELEGANCE Shallow Coffe White 24" x 24"

Details ▾ Easy Elegance shallow coffer panels in white offer a classic coffered look at a fraction of the cost of custom work. These panels are made of rigid PVC and easily fit into a standard suspension system.

Order a Sample



Installation Method

Suspended/Drop (accessibility)



Edge Detail

Tegular Edge (minimizes grid look)

Coffered Look, No Drywall Borders

Interested in a coffered look in a traditional ceiling material? Concerned about installing a drywall border? Consider our Single Raised Panel.



Colors & Options

OTHER COLORS



Black

OTHER DESIGNS

Details ▾



Deep Coffe

Installation

EXPLORE OPTIONS BELOW.

Read the detailed installation instructions before starting your project.



Prelude 15/16" Grid System

Used to install 24"x 24" or 24"x 48" drop ceiling panels designed for 15/16" grid systems.

Details ▾

Components include main beams, cross tees, wall molding, and hanger wire.

SKILL LEVEL

Advanced

PDF [QUICK INSTALLATION OVERVIEW](#)

REQUIRED MATERIALS

- [Prelude XL 15/16" Grid System](#)

 [Tools You May Need](#)



QuickHang Installation Kits

Details

These kits contain everything you need to install 64 sq. ft. of drop ceiling panels designed for 15/16" grid systems. Kit components include the required number of main beams, cross tees, wall molding, and QUICKHANG grid hooks and brackets for easy and fast installation and leveling.

SKILL LEVEL

Intermediate

PDF [QUICK INSTALLATION OVERVIEW](#)





REQUIRED MATERIALS


- [QUICKHANG Installation Kits](#)

Kits for 24" x 24" (white and black) and 24" x 48" (white only) ceiling panels are available.


 [Tools You May Need](#)

Details

| | |
|---|--|
| Model Number | 1282BXA |
| Color | White |
| Product Type | Ceilings |
| Installation Method |  Suspended/Drop (accessibility) |
| Edge Detail |  Tegular Edge (minimizes grid look) |
| <u>Sag / Humidity Resistance</u> |  Superior (Inherent) |
| <u>Mold Resistance</u> |  Superior (Inherent) |

| | |
|---|--|
| Detail <u>Fire Resistance</u> |  Class A, Residential Use Only |
| Size (L x W) | 24" x 24" |
| Thickness | 0.70" |
| Material Type | Lightweight PVC |
| Style (Look) | Coffered |
| Collection | <u>Plastic Ceiling Panels</u> |
| <u>Light Reflectance</u> | 0.85 |
| Rooms / Solutions | Basement Dining Room |
| Design | Shallow Coffered |

Resources

| |
|--|
| PDF BROCHURE - EASY ELEGANCE INSTALLATION FAQs |
| PDF INSTALLATION INSTRUCTIONS - EASY ELEGANCE CEILING PANELS |
| PDF SDS - EASY ELEGANCE CEILING PANELS |
| PDF WARRANTY - LIMITED LIFETIME |
|  PRINT PRODUCT SPECS |

What's in the Box?

| | |
|---------------------------|---------------------------------------|
| Standard Packaging | Covers 4 sq. ft. Sold by the piece |
|---------------------------|---------------------------------------|

Details ▾

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SECTION 09 6010 - FLOORING TRANSITION

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data.
- C. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each product specified.

PART 2 PRODUCTS

| | Carpet | Terrazzo | Resilient Flooring | Wood | Tile - at Door | Tile - Field | Resinous Flooring | Exposed Concrete |
|------------------------------|--------|----------|-----------------------|------|-------------------|-----------------|----------------------|---------------------|
| CARPET | N | | | | | | | |
| TERRAZZO | A | M | | | | | | |
| RESILIENT | F | B | H | | | | | |
| WOOD | K | C | K | N | | | | |
| TILE - AT DOOR | L | L | L | L | L | | | |
| TILE - FIELD | A | C | B | D | N | N | | |
| RESINOUS FLOORING | A | C | C | J | L | B | M | |
| EXPOSED CONCRETE | G | E | G | J | L | E | C | N |

* **Note: Flooring keyed into slab.**

Use Fusion Transition Strip at LVT to Carpet

Description

- A Metal Schluter Reno-TK, Size appropriate for material thicknesses.
- B Metal Schluter-Reno-U, Size appropriate for material thicknesses.
- C Metal Schluter-SCHIENE, Size appropriate for material thicknesses.
- D Metal Schluter-RENO-T, Size appropriate for material thicknesses.
- E Metal Schluter-RENO-RAMP, Size appropriate for material thicknesses.
- F Resilient Johnsonite CTA-XX-H, 1/8" to 1/4"
- G Resilient Johnsonite CTA-XX-J, 0" to 1/4"
- H Resilient Johnsonite CTA-XX-X, 0.80" to 1/8"
- J Resilient Johnsonite CTA-XX-D, 0" to 1/2"
- K Resilient Johnsonite CD-XX-B, 1/8" to 1/2"
- L Marble Threshold.
- M Divider Strip.
- N No Transition Required.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

PART 3 EXECUTION

3.01 INSTALLATION

- A. Coordinate and install transitions between each type of flooring in accordance with the table above and the respective flooring specifications.

END OF SECTION

Fusion

Rubber Transition Strip

When carpet and resilient flooring adjoin, there are often differences in product heights. Eliminate the problem with Fusion Rubber Transition Strips. Place Fusion Strips wherever carpet meets resilient flooring to create a subtle transition with minimal visual interruption. The compact strips are quick and easy to apply during flooring installation. The result is a safer, more attractive floor.

Product Information

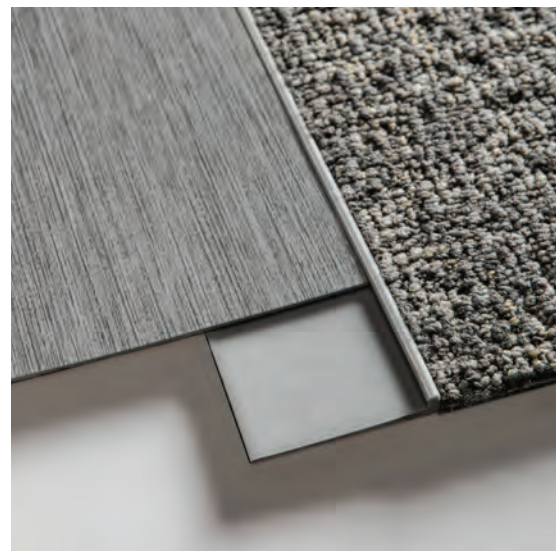
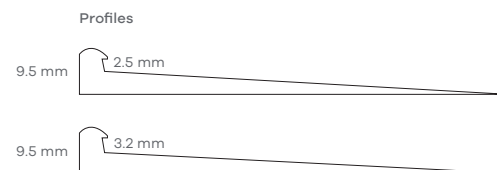
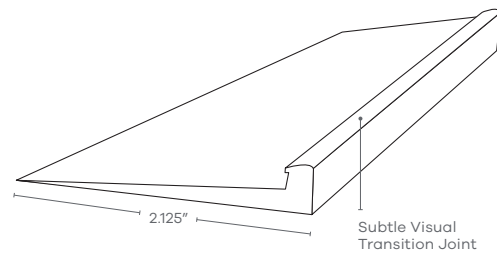
- Two profiles transition from 2.5 mm to 9.5 mm and 3.2 mm to 9.5 mm, respectively
- Standard colors are Platinum Metallic 117 and all 36 Accord Colors
- Non-standard colors require a 5 carton minimum order
- 2.125" reduction width, 12' length
- 25 pieces of 12' sections per carton (300 lin ft)

Warranted To Work

Fusion Rubber Transition Strips are backed by our limited 2-year wear warranty with proper installation.

Compact Mixed Flooring Reducer

Fusion Rubber Transition Strips provide a 6-7 mm reduction over 2.125 inches that are easy to install.



Environmental Attributes

- FloorScore Certified; CDPH v 1.1 - 2010
- May contribute to LEED credits
- mindfulMaterials

SECTION 096519 - RESILIENT TILE FLOORING- LVT-

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. Solid vinyl floor tile (Luxury Vinyl Tile)-

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units of each color and pattern of floor tile required.
- C. Product Schedule: For floor tile- See finish schedule.
- D. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.

1.5 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.

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F spaces to receive floor tile during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. 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 floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 SOLID VINYL FLOOR TILE- LVT- Luxury Vinyl Tile-

- A. Products: Subject to compliance with requirements, Provide the following products as indicated on the Construction Drawings.
 - 1. LVT-1- Mannington Commercial- Uninterrupted Collection-
 - Size- 7.25"X48"
 - Thickness- 4mm
 - Color- Mocha Walnut
 - Installation- See Architectural

NOTE: See Finish Schedule and Finish Plan for locations.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile and substrate conditions indicated. Per manufacturer's recommendation.
- C. Seamless-Installation Accessories:
 - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.

- a. Color: Match floor tile
2. Chemical-Bonding Compound: Manufacturer's product for chemically bonding seams.

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.
- B. 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.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install tiles until they are same temperature as space where they are to be installed.
 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- D. Wipe and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out 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 wall axis

- C. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles in pattern of colors and sizes indicated.
- D. 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.
- 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, nonstaining marking device.
- F. Install tiles on covers for electrical outlets and switches, building expansion-joint covers, and similar items in finished 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 tiles to flooring 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.
- H. Seamless Installation:
 - 1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to permanently fuse sections into a seamless wall covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining surfaces.
 - 2. Chemically Bonded Seams: Bond seams with chemical-bonding compound to permanently fuse sections into a seamless wallcovering. Prepare seams and apply compound to produce tightly fitted seams without gaps, overlays, or excess bonding compound on wall covering surfaces.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Wipe and vacuum surfaces thoroughly.
 - 3. Damp-wipe surfaces to remove marks and soil.
- C. Protect tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION 096519



Uninterrupted Collection

Mannington
COMMERCIAL



Cover: Wood - Heartwood Oak UN204, **Memento Modular** - Circular 52637
Above: Stone - Coastal Dune UN300



Stone - Carbonate UN306



Smooth Transitions

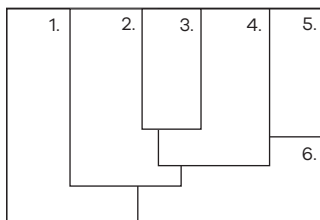
Uninterrupted LVT is thick enough to provide a seamless transition to carpet without the use of transition strips. This ensures a seamless, cohesive look in spaces with multiple flooring types, and with Mannington Commercial's wide array of visually stunning carpet coordinates, design possibilities are only limited by imagination.



- No transition strip needed between Uninterrupted LVT and carpet, creating a seamless, cohesive look
- Wood and stone visuals coordinate beautifully with Mannington Commercial's range of carpet collections
- Features Quantum Guard Elite® technology for best-in-class performance and durability

Uninterrupted Collection Coordinates

Uninterrupted LVT is designed to pair beautifully with a wide range of our collections, all while eliminating the need for transition strips to carpet. Uninterrupted's versatile wood and stone visuals work with styles from classic to contemporary, and palettes from warm to cool. Without the visual break of a transition between the LVT and carpet, you can use the right type of flooring in each area of a space while maintaining a coherent design.



- | | |
|---|--|
| 1. Color Anchor, Stride, Crumb Cake | 5. Color Anchor, Orchard |
| 2. Heirloom, Memento, Circular | 6. Color Anchor, ColorScape, Beach Sand |
| 3. Uninterrupted, Wood, Harvest Walnut | |
| 4. Uninterrupted, Stone, Carbonate | |



Success Is in Our Science

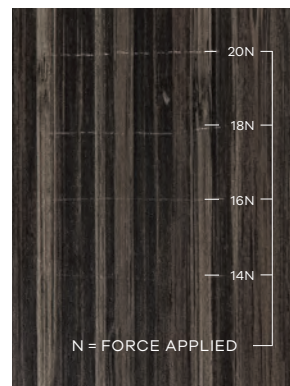
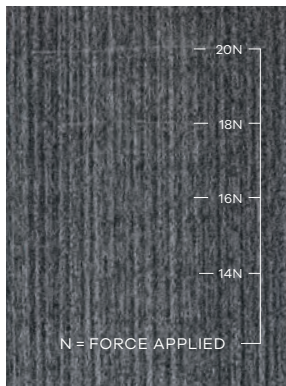
Introducing an advancement in our proven Quantum Guard technology: Quantum Guard Elite. This patent pending technology provides the ultimate solution for all aspects of LVT performance.

- Highest scratch resistance in the industry
- Engineered for best-in-class dimensional stability
- Superior impact resistance
- Cuts cleanly for highest quality installation
- Easy no-polish maintenance significantly reduces overall life cycle cost and total cost of ownership
- Advanced stain resistance

Outperforms in Scratch Resistance

Quantum Guard Elite

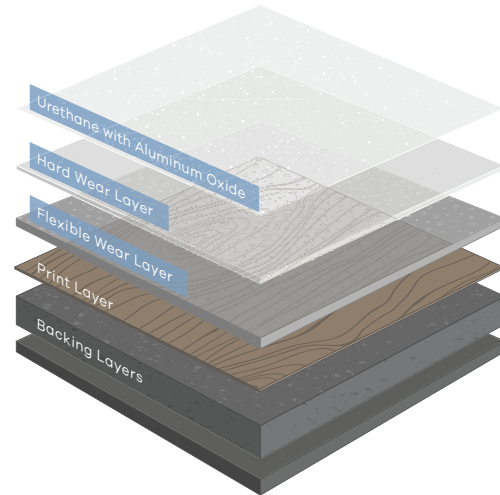
Leading Competitor



With a patent-pending two-part wear layer and aluminum oxide infused top coat, Quantum Guard Elite offers superior scratch resistance vs. the leading competitor.

Complete Multi-Layered Protection

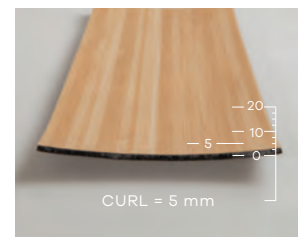
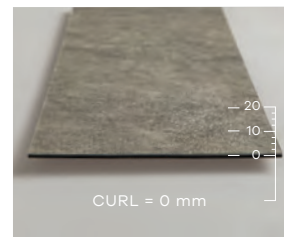
Quantum Guard Elite combines a hard wear layer and a flexible wear layer for superior durability with the added protection of our proprietary aluminum oxide technology.



Best-in-Class Dimensional Stability

Quantum Guard Elite

Leading Competitor



LVT with Quantum Guard Elite is fully engineered to offer the perfect balance of hardness and flexibility, which helps prevent product failures in commercial environments. Products exposed to 80 ° C for six hours.

Warranted to Work

Products with Quantum Guard Elite feature our Limited Quantum Guard Elite Wear Warranty and Limited Commercial Warranty.

Uninterrupted Collection Product Availability



| Product Name | Product Code | Surface Finish - Barnwood | Surface Finish - Wood Tick | Surface Finish - Ceramic | Quantum Guard Elite® | 7.25" x 48" (184 x 1219 mm) | 12" x 24" (305 x 610 mm) |
|-----------------|--------------|------------------------------|-------------------------------|-----------------------------|----------------------|--------------------------------|-----------------------------|
| WOOD | | | | | | | |
| Earthy Chestnut | UN206 | • | | | • | • | |
| Harvest Walnut | UN208 | | • | | • | • | |
| Heartwood Oak | UN204 | • | | | • | • | |
| Mocha Walnut | UN214 | | • | | • | • | |
| Pearly Oak | UN200 | • | | | • | • | |
| Russet Maple | UN210 | | • | | • | • | |
| Sepia Maple | UN212 | | • | | • | • | |
| Silvered Oak | UN202 | • | | | • | • | |
| STONE | | | | | | | |
| Carbonate | UN306 | | | • | • | | • |
| Coastal Dune | UN300 | | | • | • | | • |
| Gravel | UN302 | | | • | • | | • |
| Weathered Shale | UN304 | | | • | • | | • |

Uninterrupted Collection

| Style | Uninterrupted - Stone | Uninterrupted - Wood |
|------------------------------------|---|--|
| Construction | Luxury Vinyl Tile Non-ortho Phthalate | Luxury Vinyl Tile Non-ortho Phthalate |
| Classification | ASTM F1700 Class III, Type B | ASTM F1700 Class III, Type B |
| Total Thickness | 0.1575" (4.0 mm) | 0.1575" (4.0 mm) |
| Wear Layer Thickness | 20 mil (0.51 mm) | 20 mil (0.51 mm) |
| Wear Layer | Quantum Guard Elite® | Quantum Guard Elite® |
| Edge Treatment | Micro-bevel | Micro-bevel |
| Sizes | 12" x 24" (305 x 610 mm) | 7.25" x 48" (184 x 1219 mm) |
| Colors | 4 | 8 |
| Packaging | 11 pcs, 22 ft ² (2.044 m ²), 29.04 lbs (13.17 kg) | 12 pcs, 29 ft ² (2.694 m ²), 38.28 lbs (17.36 kg) |
| Adhesive | Porous & Non-porous Substrates: V-95 Full Spread, 2-part Epoxy V-88 Full Spread, Transitional Pressure Sensitive, High Moisture XpressStep for LVT & Sheet Vinyl Full Coverage Spray XpressStep Premium for LVT Full Coverage High Moisture Spray Porous Substrates Only: V-82 Full Spread Note: Must use V-95, XpressStep or XpressStep Premium adhesive under hospital beds and heavy rolling load areas. Use V-95 where higher risk of topical moisture would be a concern. | |
| Installation Method | All arrows in the same direction. Planks should have end joints offset by at least 6" and staggered to create a random appearance. Tiles should be installed block or staggered. | |
| Testing | | |
| HUD/FHA | Passes | |
| Flexibility (ASTM F137) | Passes - 1" Mandrel - No Crack/Break | |
| Dimensional Stability (ASTM F2199) | Passes - Max 0.020 in/in ft | |
| Squareness (ASTM F540) | Passes - Max 0.010" | |
| Static Load (ASTM F970 mod.) | Passes - 2,000 PSI; Residual Indent ≤ 0.005" | |
| Residual Indentation (ASTM F1914) | Passes - < 8% Avg / 10% Single Value | |
| Flooring Radiant Panel (ASTM E648) | Passes - Class 1; ≥ 0.45 watts/cm ² | |
| Smoke Density (ASTM E662) | Passes - ≤ 450 | |
| Slip Resistance (ASTM C1028) | Passes - ≥ 0.5 Leather; 0.6 Rubber | |
| Resistance to Light (ASTM F1515) | Passes | |
| Chemical Resistance (ASTM F925) | Passes | |
| Resistance to Heat (ASTM F1514) | Passes | |
| Environmental Data | | |
| Rapidly Renewable Content | Contains 2% rapidly renewable resource content | |
| Indoor Air Quality | FloorScore Certified; CDPH v1.1-2010 | |
| Product Declarations | EPD, HPD | |
| LEED Scoreboard | May contribute to LEED credits: LEED 2009: MRc5 Regional Materials; MRc6 Rapidly Renewable Materials; IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials - Flooring LEED v4: Building Product Disclosure & Optimization - EPDs; Building Product Disclosure & Optimization - Sourcing Raw Materials; Building Product Disclosure & Optimization - Material Ingredients; IEQc2 - Low Emitting Materials | |
| mindful MATERIALS | Visit mM Origin website, mindfulmaterials.origin.build, for current transparency information | |
| Manufacturing | Madison, GA (USA) - ISO 14001 EMS & ISO 9001 QMS Registered | |
| Warranty | | |
| | Limited 15 Year Commercial Warranty Limited 15 Year Quantum Guard Elite® Wear Warranty | |

| Style | Uninterrupted - Stone | Uninterrupted - Wood |
|------------------------------------|--|--|
| Construction | Luxury Vinyl Tile | Luxury Vinyl Tile |
| Classification | ASTM F1700 Class III, Type B | ASTM F1700 Class III, Type B |
| Total Thickness | 0.1575" (4.0 mm) | 0.1575" (4.0 mm) |
| Wear Layer Thickness | 20 mil (0.51 mm) | 20 mil (0.51 mm) |
| Wear Layer | Quantum Guard Elite® | Quantum Guard Elite® |
| Edge Treatment | Micro-bevel | Micro-bevel |
| Sizes | 12" x 24" (305 x 610 mm) | 7.25" x 48" (184 x 1219 mm) |
| Colors | 4 | 8 |
| Packaging | 11 pcs, 22 ft ² (2.044 m ²), 29.04 lbs (13.17 kg) | 12 pcs, 29 ft ² (2.694 m ²), 38.28 lbs (17.36 kg) |
| Adhesive | <p>Porous & Non-porous Substrates: V-95 Full Spread, 2-part Epoxy V-88 Full Spread, Transitional Pressure Sensitive, High Moisture XpressStep for LVT & Sheet Vinyl Full Coverage Spray XpressStep Premium for LVT Full Coverage High Moisture Spray</p> <p>Porous Substrates Only: V-82 Full Spread</p> <p>Note: Must use V-95, XpressStep or XpressStep Premium adhesive under hospital beds and heavy rolling load areas. Use V-95 where higher risk of topical moisture would be a concern.</p> | |
| Installation Method | All arrows in the same direction. Planks should have end joints offset by at least 6" and staggered to create a random appearance. Tiles should be installed block or staggered. | |
| Testing | | |
| HUD/FHA | Passes | |
| Flexibility (ASTM F137) | Passes - 1" Mandrel - No Crack/Break | |
| Dimensional Stability (ASTM F2199) | Passes - Max 0.020 in/in ft | |
| Squareness (ASTM F540) | Passes - 0.010" Max | |
| Static Load (ASTM F970 mod.) | Passes - 2,000 PSI; Residual Indent ≤ 0.005" | |
| Residual Indentation (ASTM F1914) | Passes - < 8% Avg / 10% Single Value | |
| Flooring Radiant Panel (ASTM E648) | Passes - Class 1; ≥ 0.45 watts/cm ² | |
| Smoke Density (ASTM E662) | Passes - ≤ 450 | |
| Slip Resistance (ASTM C1028) | Passes - ≥ 0.5 Leather; 0.6 Rubber | |
| Resistance to Light (ASTM F1515) | Passes | |
| Chemical Resistance (ASTM F925) | Passes | |
| Resistance to Heat (ASTM F1514) | Passes | |
| Environmental Data | | |
| Rapidly Renewable Content | Contains 2% rapidly renewable resource content | |
| Indoor Air Quality | FloorScore Certified; CDPH v1.1-2010 | |
| Product Declarations | EPD | |
| LEED Scoreboard | May contribute to LEED credits: LEED 2009: MRc5 Regional Materials; MRc6 Rapidly Renewable Materials; IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials - Flooring LEED v4: Building Product Disclosure & Optimization - EPDs; Building Product Disclosure & Optimization - Sourcing Raw Materials; IEQc2 - Low Emitting Materials | |
| mindful MATERIALS | Visit mM Origin website, mindfulmaterials.origin.build, for current transparency information | |
| Manufacturing | Madison, GA (USA) - ISO 14001 EMS & ISO 9001 QMS Registered | |
| Warranty | | |
| | Limited 15 Year Commercial Warranty Limited 15 Year Quantum Guard Elite® Wear Warranty | |

Crafted with purpose



SECTION 09 6800 – CARPET TILES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered.

1.02 REFERENCES

1.03 SUBMITTALS

- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two samples 24" x 24" inch in size illustrating color and pattern for each carpet and cushion material specified.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS

- A. Refer to Section 01 6000 - Product Requirements.

2.02 LEED REQUIREMENTS:

- A. Materials and Resources - Recycled Content:
- B. Indoor Environmental Quality - Low-Emitting Materials - Adhesives and Sealants:
 - 1. Provide adhesives complying with South Coast Rule No. 1168 by the South Coast Air Quality Management District.
 - a. Indoor Carpet Adhesives: 50 g/l.
 - b. Carpet Pad Adhesives: 50 g/l.
- C. Indoor Environmental Quality - Low-Emitting Materials - Carpet:
 - 1. Provide carpet bearing The Carpet and Rug Institute (CRI) Green Label Plus certification.
 - 2. Provide carpet cushion bearing The Carpet and Rug Institute (CRI) Green Label certification.

2.03 MANUFACTURERS

- A. Carpet:
 - 1. Basis of Design – Mannington Commercial

2.04 CARPET TILE

- | | |
|-------------------------------|-----------------------------|
| A. CPT—Mannington Commercial- | Googie Collection- |
| Size- | 24"X24" |
| Thickness- | 2.59mm |
| Color- | To be selected by Architect |
| Installation- | See Architectural Drawings |

NOTE: See Finish Schedule for locations

2.05 ACCESSORIES

- A. Sub-Floor Filler: Type recommended by carpet manufacturer.
- B. Contact Adhesive: Compatible with carpet material; releasable type.
 - 1. Grid-Set Green Glue 2000.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
- B. Verify that sub-floor surfaces are dust-free and free of substances which would impair bonding of adhesives to sub floor surfaces.
- C. Verify that concrete sub-floor surfaces are ready for carpet installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by carpet manufacturer and adhesive materials manufacturer.

3.02 CARPET TILE INSTALLATION

- A. Install carpet tile in accordance with manufacturer's instructions and CRI 104.
- B. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- C. Fully adhere carpet tile to substrate.
- D. Trim carpet tile neatly at walls and around interruptions.
- E. Complete installation of edge strips, concealing exposed edges.

3.03 CLEANING

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.

END OF SECTION

Googie Collection

| Style | Multiplexer (Broadloom) | Multiplexer (Modular) | Phenomena (Broadloom) |
|--------------------------------------|---|---|---|
| Construction | Patterned Loop | Patterned Loop | Patterned Loop |
| Face Fiber | Type 6,6 Nylon | Type 6,6 Nylon | Type 6,6 Nylon |
| Dye Method | Solution/Yarn | Solution/Yarn | Solution/Yarn |
| Gauge | 5/64 (50.39 per 10 cm) | 5/64 (50.39 per 10 cm) | 5/64 (50.39 per 10 cm) |
| Stitches Per Inch | 10.33 (40.67 per 10 cm) | 10.33 (40.67 per 10 cm) | 10 (39.37 per 10 cm) |
| Density | 7,826 (290.80 kg/m ³) | 7,826 (290.80 kg/m ³) | 7,659 (284.59 kg/m ³) |
| Pile Thickness | 0.092" (2.34 mm) | 0.092" (2.34 mm) | 0.094" (2.39 mm) |
| Weight | 20 oz/yd ² (678 g/m ²) | 20 oz/yd ² (678 g/m ²) | 20 oz/yd ² (678 g/m ²) |
| Backing Type | UltraBac® RE, Integra® HP | Infinity® 2 Modular | UltraBac® RE, Integra® HP |
| Size/Width | 12'6" (3.81 m) | 24" x 24" (60.96 x 60.96 cm) | 12'6" (3.81 m) |
| Colors | 12 | 12 | 12 |
| Pattern Repeat | 56 1/4" W x 61" L (Random) | N/A | 18 3/4" W x 21" L (Random) |
| Packaging | N/A | 8 yd ² / 18 Tiles | N/A |
| Adhesive | Ultra Adhesive Integra-2 Adhesive | Infinity 2 Adhesive | Ultra Adhesive Integra-2 Adhesive |
| Installation Method | N/A | Horizontal Brick Ashlar, Monolithic, Vertical Ashlar | N/A |
| Testing | | | |
| Dimensional Stability (Aachen Test) | Passes | | |
| Electrostatic Propensity (AATCC 134) | Less than 3.0 kV | | |
| Flooring Radiant Panel (ASTM E648) | Passes - Class 1; ≥ 0.45 watts/cm ² | | |
| Smoke Density (ASTM E662) | Passes - ≤ 450 | | |
| Methenamine Pill Test (ASTM D2859) | Passes | | |
| Hexapod (ASTM D5252) TARR | 3.5-Severe | | |
| Environmental Data | | | |
| NSF/ANSI 140 Certification | UltraBac® RE - Platinum, Integra® HP - Gold, Infinity® 2 Modular - Gold | | |
| Recycled Content | Contains recycled content | | |
| Indoor Air Quality | CRI Green Label Plus Certified | | |
| Product Declarations | EPD, HPD | | |
| LEED Scoreboard | LEED 2009: MRc5 Regional Materials; IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials - Flooring LEED v4: Building Product Disclosure & Optimization - EPDs; Building Product Disclosure & Optimization - Sourcing Raw Materials; Building Product Disclosure & Optimization - Material Ingredients; IEQc2 - Low Emitting Materials | | |
| mindful MATERIALS | Visit mM Origin website, mindfulmaterials.origin.build , for current transparency information | | |
| Manufacturing | Calhoun, GA (USA) - ISO 14001 Registered | | |
| Warranty | | | |
| | Limited Lifetime Wear & Backing Warranty Limited 15-Year XGUARD® Stain Resistant Warranty Limited 15-Year ColorSafe® Bleach Resistant Warranty | | |

- Specifications are based on averages from normal manufacturing tolerances. Such variations do not affect product performance.
- Protective chair pads are recommended under office chairs with roller casters to preserve appearance and avoid premature wear.
- As with all quality carpets, slight variation in color may occur from dye lot to dye lot.
- Backing or other materials may be changed without prior notice when shortages occur or when technological advancements provide improved product performance.
- This product is intended solely for use as an indoor floor covering and is not recommended or sold for any other purpose.
- The inherent characteristics of geometric linear patterns can result in double-dark or double-light lines at the seam and to some extent pattern run-off or bias. This is not a manufacturing defect, and as such, should be considered when selecting a modular carpet installation method.
- Please make your final selection from an actual swatch. To order samples, go to manningtoncommercial.com or call 800.241.2262 ext. 6913.

Googie Collection

| Style | Phenomena (Modular) | Skyway (Broadloom) | Skyway (Modular) |
|---------------------|---|---|---|
| Construction | Patterned Loop | Patterned Loop | Patterned Loop |
| Face Fiber | Type 6,6 Nylon | Type 6,6 Nylon | Type 6,6 Nylon |
| Dye Method | Solution/Yarn | Solution/Yarn | Solution/Yarn |
| Gauge | 5/64 (50.39 per 10 cm) | 5/64 (50.39 per 10 cm) | 5/64 (50.39 per 10 cm) |
| Stitches Per Inch | 10 (39.37 per 10 cm) | 9.83 (37.70 per 10 cm) | 9.83 (37.70 per 10 cm) |
| Density | 7,659 (284.59 kg/m ³) | 7,135 (265.12 kg/m ³) | 7,135 (265.12 kg/m ³) |
| Pile Thickness | 0.094" (2.39 mm) | 0.111" (2.81 mm) | 0.111" (2.81 mm) |
| Weight | 20 oz/yd ² (678 g/m ²) | 22 oz/yd ² (746 g/m ²) | 22 oz/yd ² (746 g/m ²) |
| Backing Type | Infinity [®] 2 Modular | UltraBac [®] RE, Integra [®] HP | Infinity [®] 2 Modular |
| Size/Width | 24" x 24" (60.96 x 60.96 cm) | 12'6" (3.81 m) | 24" x 24" (60.96 x 60.96 cm) |
| Colors | 12 | 12 | 12 |
| Pattern Repeat | N/A | 78" W x 168" L (Random) | N/A |
| Packaging | 8 yd ² / 18 Tiles | N/A | 8 yd ² / 18 Tiles |
| Adhesive | Infinity 2 Adhesive | Ultra Adhesive Integra-2 Adhesive | Infinity 2 Adhesive |
| Installation Method | Horizontal Brick Ashlar, Monolithic, Vertical Ashlar | N/A | Horizontal Brick Ashlar, Monolithic, Vertical Ashlar |

Testing

| | |
|--------------------------------------|--|
| Dimensional Stability (Aachen Test) | Passes |
| Electrostatic Propensity (AATCC 134) | Less than 3.0 kV |
| Flooring Radiant Panel (ASTM E648) | Passes - Class 1; ≥ 0.45 watts/cm ² |
| Smoke Density (ASTM E662) | Passes - ≤ 450 |
| Methenamine Pill Test (ASTM D2859) | Passes |
| Hexapod (ASTM D5252) TARR | 3.5-Severe |

Environmental Data

| | |
|----------------------------|---|
| NSF/ANSI 140 Certification | UltraBac [®] RE - Platinum, Integra [®] HP - Gold, Infinity [®] 2 Modular - Gold |
| Recycled Content | Contains recycled content |
| Indoor Air Quality | CRI Green Label Plus Certified |
| Product Declarations | EPD, HPD |
| LEED Scoreboard | LEED 2009: MRC5 Regional Materials; IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials - Flooring LEED v4: Building Product Disclosure & Optimization - EPDs; Building Product Disclosure & Optimization - Sourcing Raw Materials; Building Product Disclosure & Optimization - Material Ingredients; IEQc2 - Low Emitting Materials |
| mindful MATERIALS | Visit mM Origin website, mindfulmaterials.origin.build , for current transparency information |
| Manufacturing | Calhoun, GA (USA) - ISO 14001 Registered |

Warranty

- Limited Lifetime Wear & Backing Warranty
- Limited 15-Year XGUARD[®] Stain Resistant Warranty
- Limited 15-Year ColorSafe[®] Bleach Resistant Warranty

- Specifications are based on averages from normal manufacturing tolerances. Such variations do not affect product performance.
- Protective chair pads are recommended under office chairs with roller casters to preserve appearance and avoid premature wear.
- As with all quality carpets, slight variation in color may occur from dye lot to dye lot.
- Backing or other materials may be changed without prior notice when shortages occur or when technological advancements provide improved product performance.
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- Please make your final selection from an actual swatch. To order samples, go to manningtoncommercial.com or call 800.241.2262 ext. 6913.

Googie Collection

| Style | Telejector (Broadloom) | Telejector (Modular) |
|---|---|--|
| Construction | Patterned Loop | Patterned Loop |
| Face Fiber | Type 6,6 Nylon | Type 6,6 Nylon |
| Dye Method | Solution/Yarn | Solution/Yarn |
| Gauge | 5/64 (50.39 per 10 cm) | 5/64 (50.39 per 10 cm) |
| Stitches Per Inch | 10.33 (40.67 per 10 cm) | 10.33 (40.67 per 10 cm) |
| Density | 7,058 (262.26 kg/m ³) | 7,058 (262.26 kg/m ³) |
| Pile Thickness | 0.102" (2.59 mm) | 0.102" (2.59 mm) |
| Weight | 20 oz/yd ² (678 g/m ²) | 20 oz/yd ² (678 g/m ²) |
| Backing Type | UltraBac® RE, Integra® HP | Infinity® 2 Modular |
| Size/Width | 12'6" (3.81 m) | 24" x 24" (60.96 x 60.96 cm) |
| Colors | 12 | 12 |
| Pattern Repeat | 78" W x 71" L (Random) | N/A |
| Packaging | N/A | 8 yd ² / 18 Tiles |
| Adhesive | Ultra Adhesive Integra-2 Adhesive | Infinity 2 Adhesive |
| Installation Method | N/A | Horizontal Brick Ashlar, Monolithic, Vertical Ashlar |
| Testing | | |
| Dimensional Stability (Aachen Test) | Passes | |
| Electrostatic Propensity (AATCC 134) | Less than 3.0 kV | |
| Flooring Radiant Panel (ASTM E648) | Passes - Class 1; ≥ 0.45 watts/cm ² | |
| Smoke Density (ASTM E662) | Passes - ≤ 450 | |
| Methenamine Pill Test (ASTM D2859) | Passes | |
| Hexapod (ASTM D5252) TARR | 3.5-Severe | |
| Environmental Data | | |
| NSF/ANSI 140 Certification | UltraBac® RE - Platinum, Integra® HP - Gold, Infinity® 2 Modular - Gold | |
| Recycled Content | Contains recycled content | |
| Indoor Air Quality | CRI Green Label Plus Certified | |
| Product Declarations | EPD, HPD | |
| LEED Scoreboard | LEED 2009: MRc5 Regional Materials; IEQ4.1 Low Emitting Adhesives; IEQ4.3 Low Emitting Materials - Flooring LEED v4: Building Product Disclosure & Optimization - EPDs; Building Product Disclosure & Optimization - Sourcing Raw Materials; Building Product Disclosure & Optimization - Material Ingredients; IEQc2 - Low Emitting Materials | |
| mindful MATERIALS | Visit mM Origin website, mindfulmaterials.origin.build , for current transparency information | |
| Manufacturing | Calhoun, GA (USA) - ISO 14001 Registered | |
| Warranty | | |
| | Limited Lifetime Wear & Backing Warranty Limited 15-Year XGUARD® Stain Resistant Warranty Limited 15-Year ColorSafe® Bleach Resistant Warranty | |

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Google Collection

Ideal for education environments, Google captures the optimistic energy and fun of space-age themed Google architecture. In broadloom and modular carpet, the patterns combine the strong sense of movement and jutting angles of the futurist design aesthetic with a versatile palette of neutrals and accent brights.





Multiplexer (Modular) - Cycloplane 11633,
Helmetron 13634, Geotron 41635
Installation - Monolithic



Skyway (Broadloom) - Phantomic 32641

THE COLORWAYS ALLOW FOR THE CAREFUL DEPLOYMENT OF COLOR, ENABLING A NEUTRAL SPACE WITH CONTROLLED POPS OF BRIGHTS.

Styles / Colors

- **Multiplexer**
 - 12 colors, 24" x 24" tile and 12'6" broadloom
 - Delicate, modern crosshatch pattern
- **Phenomena**
 - 12 colors, 24" x 24" tile and 12'6" broadloom
 - Textural coordinate with small-scale gridding
- **Skyway**
 - 12 colors, 24" x 24" tile and 12'6" broadloom
 - Medium-scale diagonal grid with subtle energy
- **Tejector**
 - 12 colors, 24" x 24" tile and 12'6" broadloom
 - Large-scale angular pattern emphasizing movement
- All in 20 oz weight, except Skyway in 22 oz weight

Performance Benefits

- The Googie Collection was specifically designed with a 3.5 TARR rating for use in severe environments with rigorous traffic. Our TARR rating is tested and verified by an independent lab.
- High-moisture solutions in backings and adhesives

Environmental Data

- Infinity® 2 Modular backing certified NSF/ANSI 140 Gold
- UltraBac® RE certified NSF/ANSI 140 Gold, Integra® HP certified NSF/ANSI 140 Gold
- Product-specific Type III EPD, published HPD

Warranty

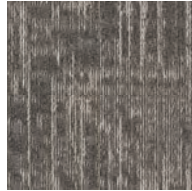
- Limited Lifetime Wear & Backing Warranty
- Limited 15-Year XGUARD® Stain Resistance Warranty
- Limited 15-Year ColorSafe® Bleach Resistance Warranty

For more details, visit manningtoncommercial.com

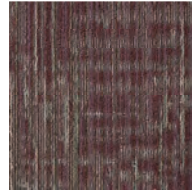


Multiplexer

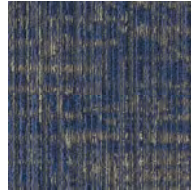
Cycloplane 11633



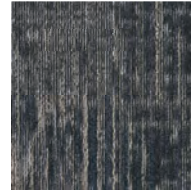
Helmetron 13634



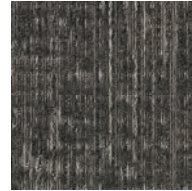
Dynasphere 22643



Aquatomic 31645



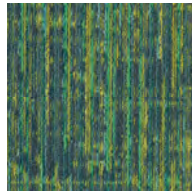
Phantomic 32641



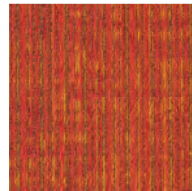
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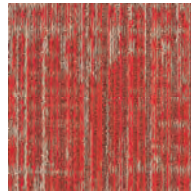
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Seacopter 43636



Solartron 63640



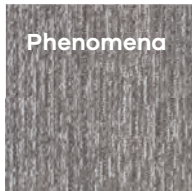
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Cybernetic 81637



Retroscope 83638



Phenomena

Cycloplane 11633



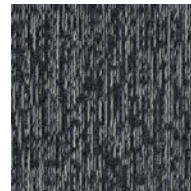
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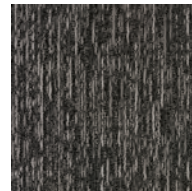
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Aquatomic 31645



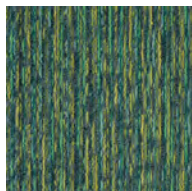
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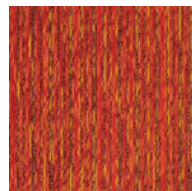
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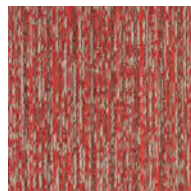
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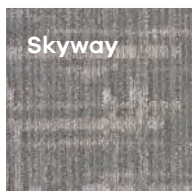
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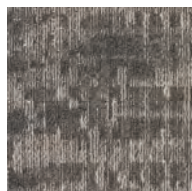


Retroscope 83638



Skyway

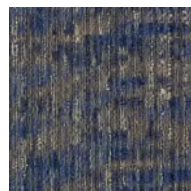
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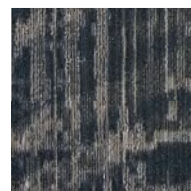
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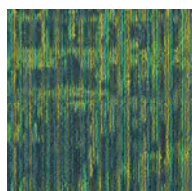
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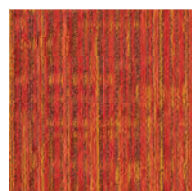
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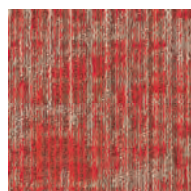
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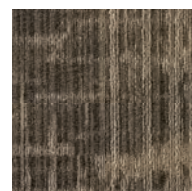
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Atomicron 71639



Cybernetic 81637



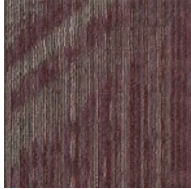
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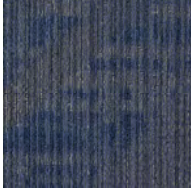
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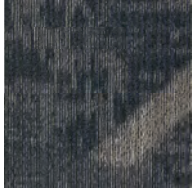
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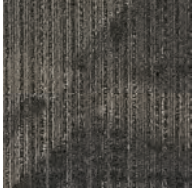
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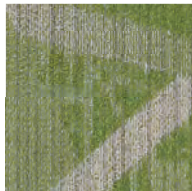
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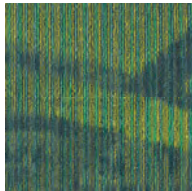
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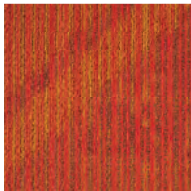
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Seacopter 43636



Solartron 63640



Atomicron 71639



Cybernetic 81637



Retroscope 83638

Specification

Mannington Infinity 2 Adhesive Specification

DESCRIPTION

Infinity 2 Adhesive is a high-solids ultra-premium acrylic pressure sensitive adhesive for use with Mannington's backed carpet. This product has been developed to address problems of moisture vapor emissions in concrete slabs. Infinity 2 Adhesive is the appropriate adhesive for installing Mannington's Infinity® 2, Infinity® 2 MG, Infinity® 2 MG Cushion, and rEvolve®II modular backing systems over porous and non-porous sub floors.

ADVANTAGES

- Easy Application
- Quick Grab
- No Solvents
- Low VOC's
- Non-Flammable
- Freeze / Thaw stable
- CRI GLP Certified

SURFACE PREPARATION

Infinity 2 Adhesive may be used over properly prepared concrete, wood, terrazzo, steel and other suitable substrates. Bring high spots level by sanding, grinding etc., fill and smooth low spots or rough surface. Use only high-quality Portland cement-based materials with a minimum 3000 psi compressive strength (ASTM C109). Mix with water only, do not use latex. The sub floor must be clean (free of dirt, dust, old adhesives, grease, wax, or other contaminants that may stain or prevent adhesion), smooth, flat, sound, fit for purpose, and free of movement. Concrete sub floors must be fully cured, clean, free from curing agents.

No Moisture Testing Required for Infinity 2 Modular or rEvolve II backing when installed with Infinity 2 Adhesive provided the slab meets ASTM F710 including the presence of an intact moisture vapor retarder per ASTM E1745 (Class B Minimum), is in direct contact with the concrete slab, no standing water, no free liquids present, no evidence of moisture staining, and no hydrostatic pressure, for porous installations only. PH testing is required with a limit of 12

For all other condition's or when the above requirements are not met, the Infinity 2 Modular or rEvolve II backing limits are in-situ relative humidity (maximum RH 95% per ASTM F-2170) and/or moisture vapor emissions (maximum 10 lbs./1,000 SF/24 hrs. per ASTM F-1869). Concrete must have a 12 pH (ASTM F-710). On-grade and below-grade concrete slabs must have an approved vapor retarder (ASTM E-1745) which is properly installed (ASTM E-1643).

No Moisture Testing Required for Infinity 2 MG and Infinity 2 MG Cushion backings when installed with Infinity 2 Adhesive provided the slab meets ASTM F-710 excluding the presence of an intact moisture vapor retarder, no standing water, no free liquids present, no evidence of moisture staining, no hydrostatic pressure.

INSTALLATION

After spreading the Infinity 2 Adhesive, allow adhesive to dry, no adhesive transfer to your finger. The working time will vary with the temperature, humidity, and porosity of the subfloor.

Specification

TROWEL SIZE AND COVERAGE

Over Porous / Non-Porous Surfaces: 1/16" x 1/32" x 1/32" U notched trowel / Coverage: 25 sq yd/gal

PACKAGING

Size: 1 gallon, 4 gallons

Order Code: 443637, 443639

Weight: 10 lbs., 40 lbs.

STORAGE

Store Infinity 2 Adhesive in climate controlled interior locations only between 50 - 90°F. Protect from freezing. Infinity 2 Adhesive is freeze/thaw stable to 10°F, but prolonged or repeated freeze/thaw cycles should be avoided. Should the Infinity 2 Adhesive freeze, allow to thaw at room temperature and stir well before using. Infinity 2 Adhesive has a one-year shelf life on unopened containers.

CLEAN UP

Wet adhesive should be immediately removed from tools or surfaces with a clean, soapy, damp cloth. Dried adhesive can be removed with denatured alcohol or adhesive solvent.

WARRANTY

Infinity 2 Adhesive is manufactured according to exacting quality control standards specifically for the installation of Mannington's tile carpet. Infinity 2 Adhesive is warranted to be free from manufacturing defects for one year. Mannington flooring products are backed by a limited Commercial Warranty for bond and manufacturing defects. The warranty term matches the product backing warranty which can vary by type.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

SECTION 09 9100
PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. See Schedules at end of this Section.

1.02 REFERENCES

- A. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2007.
- B. ASTM D 523 - Standard Test Method for Specular Gloss; 1989 (Reapproved 1999).
- C. ASTM D 3359 - Standard Test Methods for Measuring Adhesion by Tape Test; 2008.
- D. ASTM D 4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2007.
- E. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 1992 (Reapproved 2003).
- F. Steel Structures Painting Manual, Vol. 2; Systems and Specifications; Steel Structures Painting Council (SSPC); 2008 Edition.
 - 1. SSPC-SP 1 - Solvent Cleaning; 1982 (Ed. 2004) (Part of Steel Structures Painting Manual, Vol. Two).
 - 2. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
 - 3. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).
 - 4. SSPC-SP 7 - Brush-Off Blast Cleaning; 2006.
 - 5. SSPC-SP 11 - Power Tool Cleaning to Bare Metal; 1987 (Ed. 2004) (Part of Steel Structures Painting Manual, Vol. Two).

1.03 DEFINITIONS

- A. Conform to ASTM D 16 for interpretation of terms used in this section.
- B. Gloss Ranges: Tested in accordance with ASTM D 523.
 - 1. Flat refers to a lusterless or matte finish with a gloss range between 0 and 5 when measured at a 60-degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 5 and 20 when measured at a 60-degree meter.
 - 3. Satin refers to low-to-medium-sheen finish with gloss range between 15 and 35 when measured at a 60-degree meter.
 - 4. Semi-gloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
 - 5. Gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

1.04 SUBMITTALS

- A. Product Data: Provide data on all finishing products including:
 - 1. Manufacturer name.
 - 2. Product Type.
 - 3. Product Name.



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

- 4. Product Number.
- 5. Color.

- B. Samples: Submit two paper chip samples, 6x6 inch in size for each surface finishing product and color scheduled.
- C. Manufacturer's Instructions: Indicate special surface preparation procedures.

1.06 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing. Information shall be legible.
- C. Use of off-brand containers or mixing buckets will not be allowed on the site.
- D. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions. Protect from freezing.

1.07 PROJECT CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow, on surfaces coated with frost, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- C. Do not apply exterior coatings in windy and dusty conditions.
- D. Do not apply exterior coatings in direct sunlight or on surfaces which will soon be warmed by the sun.
- E. Application Temperatures for Waterborne Paints: Minimum 45 degrees F for interiors; minimum 50 degrees F for exterior; maximum 90 degrees F (32 degrees C), unless required otherwise by manufacturer's instructions. Maintain interior temperatures until paint is completely dry and cured.
- F. Application Temperatures for Solvent Thinned Paints: Minimum 50 degrees F (10 degrees C) for interiors and exterior; maximum 95 degrees F (35 degrees C), unless required otherwise by manufacturer's instructions. Maintain interior temperatures until paint is completely dry and cured.
- G. Provide lighting level of 80 ft candles measured mid-height at substrate surface.
- H. Ventilation: Ventilate affected areas during paint application. Exhaust solvent vapors outdoors, away from air intakes and people.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS

- A. Refer to Section 01 6000 - Product Requirements.

2.03 MANUFACTURERS - PAINTS

- A. Benjamin Moore & Co: www.benjaminmoore.com. (basis of design)
- B. Duron, Inc.: www.duron.com.
- C. The Sherwin-Williams Co: www.sherwin-williams.com.

2.04 MANUFACTURER - METAL CLEANER

- A. Chemetall Oakite; Oakite 31: www.oakite.com.metal cleaner

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces, using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Plaster and Gypsum Wallboard: 8 percent.
 2. Concrete, Concrete Masonry Units, and Stucco: 12 percent.
 3. Interior Wood: 15 percent, measured in accordance with ASTM D 4442.
 4. Exterior Wood: 15 percent, measured in accordance with ASTM D 4442.
- D. Adhesion Test: Test existing paint for adhesion to substrate in accordance with ASTM D 3359, Test Method A. Results shall be a rating of 4 or better in order to be considered sound and a satisfactory base of repainting.

3.02 PREPARATION

- A. General:
1. Start of the surface preparation or paint materials application will be construed as applicator's acceptance of the surfaces as satisfactory for application of materials.
 2. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
 3. Surfaces: Correct defects and clean surfaces of substances which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
 4. Marks: Seal with sealer compatible with primer and finish coats marks which may bleed through surface finishes.
 5. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
 6. Reduce the gloss of glossy surfaces to be painted.
 7. Fill nail holes, cracks, chips, spalls, and similar damaged areas to match adjacent undamaged areas.
 8. Paint Removal:
 - a. When able due to lead based paint on wall, remove flaking, cracking, blistering, peeling or otherwise deteriorated paint and paint failing adhesion testing, by scraping with hand scrapers.
 - b. After scraping, remove large areas of paint on architectural details using sanders, heat guns or heat plates, or chemical paint removers. Do not use flame heat devices.
 - c. When chemical strippers are used in hazmat areas containing lead, neutralize substrate after stripping to a pH of 5 to 8.5. See Hazmat Abatement report for locations of hazardous materials.
 - d. Remove paint to bare substrate or first sound paint layer.
 - e. Paint removal shall not damage or mar the substrate material.
 - f. After paint removal, featheredge and sand edges smooth of remaining chipped paint.

- B. Uncoated Ferrous Metal Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing in accordance with SSPC SP-2, or sandblasting in accordance with SSPC SP-7; clean by washing with solvent or detergent in accordance with SSPC SP-1. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- C. Shop-Primed Ferrous Metal Surfaces to be Finish Painted:
 - 1. Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous.
 - 2. In flat, exposed surfaces to receive semi-gloss or gloss finish, fill dents, holes and similar voids and depressions in flat exposed surfaces with metal filler compound. Finish flush with adjacent surfaces.
 - 3. Clean surfaces with solvent in accordance with SSPC SP-1.
 - 4. Prime bare steel surfaces immediately upon detection.
- D. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent in accordance with SSPC SP-1 or detergent. Wipe with metal cleaner, rinse, and wipe dry.
- E. Metal Piping: The semitransparent film applied at the mill to some piping and tubing is not considered a shop applied primer. Where indicated to be painted, overcoat with the specified ferrous metal primer.
- F. Gypsum Board Surfaces to be Painted:
 - 1. Fill minor defects with filler compound. Spot prime defects after repair.
 - 2. Remove loose dust and dirt by brushing with a soft brush, rubbing with a cloth, or vacuum cleaning. A damp cloth may be used when water based paint materials are to be applied. Allow to dry.
- G. Wood:
 - 1. Wipe off dust and grit prior to priming.
 - 2. Scrape and clean small, dry seasoned knots, then apply a thin coat of commercial knot sealer, before application of the priming coat.
 - 3. Scrape off pitch on large, open, unseasoned knots and all other beads or streaks of pitch and sap. If the pitch is still soft, remove with mineral spirits or turpentine, and thinly coat the resinous area with knot sealer.
 - 4. Back prime concealed surfaces before installation.
 - 5. Sand between coats.
 - 6. Set finishing nails, fill holes, and prime surface imperfections. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler, colored to match the finish coat if natural finish is required, allowed to dry, and sand smooth.
 - 7. Oak and other open grain wood shall receive a coat of wood filler not less than 8 hours before application of stain and transparent finish. Remove excess filler and sand smooth.

3.03 APPLICATION

- A. Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- B. Thinning:
1. When thinning is required to suit surface, temperature, weather conditions, or application methods, paints may be thinned in accordance with the manufacturer's directions.
 2. The use of thinner shall not relieve the Contractor from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed limits on volatile organic compounds.
- C. Do not mix paint materials of different manufacturers.
- D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- F. Apply each coat to uniform appearance. Apply each coat of paint in a tint slightly darker than preceding coat unless otherwise approved. Difference in tint shall be visible at a distance of 3 feet (0.9 m) from the surface.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Minimum Coating Thickness:
1. Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness as recommended by manufacturer. Provide total dry film thickness of the entire system as recommended by manufacturer.
 2. Strip paint to ensure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces.
 3. Apply each coat of paint so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete. If application thickness or color and opacity of the paint do not achieve complete hiding, apply additional coat(s) to achieve complete hiding without change in contract price.
- I. Back prime and seal ends of exterior woodwork and edges of exterior plywood specified to be finished.

3.04 INTERIOR WALL AND CEILING JOINTS

- A. Sealant-Type Expansion Joints in Gypsum Wallboard:
1. Ensure that backer rod and joint sealant (specified in Division 7) are completed and cured prior to application of paint.
- B. Fillet Joints between Hollow Metal Door Frames and Adjacent Walls (and similar locations):
1. Ensure that backer rod and joint sealant (specified in Division 7) are completed and cured prior to application of paint.

3.05 REPAIR AND RESTORATION

- A. Reinstall electrical plates, hardware, light fixture trim, escutcheons, and fittings that were removed prior to preparing surfaces or finishing.
- B. Restore to original condition surfaces damaged or marred by painting materials application.
- C. Remove, refinish, or repaint work not complying with approved samples and other specified requirements.

3.06 PROTECTION AND CLEANING

- A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 SCHEDULE - SURFACES TO BE FINISHED

- A. Do Not Paint or Finish the Following Items:
 - 1. Items fully factory-finished unless specifically noted.
 - 2. UL, FMG, or other code required labels; fire rating labels; and equipment name, identification, performance rating, serial number and capacity labels.
 - 3. Stainless steel items.
 - 4. Face brick.
 - 5. Concealed surfaces including, but not limited to, the following:
 - a. Furred areas.
 - b. Pipe spaces.
 - c. Duct shafts.
- B. Paint the surfaces described in Schedules at the end of this Section and as follows:
 - 1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with primer only.
 - 2. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 - 3. Finish exterior field-finished doors on tops, bottoms, and side edges the same as exterior faces.
 - 4. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 - 5. Paint both sides and edges of plywood panel backers for electrical and telephone equipment before installing equipment.

3.08 EXTERIOR PRIMERS

- A. Exterior Alkyd Ferrous Metal Primer:
 - 1. Benjamin Moore & Co.; C163 IronClad Alkyd Low Lustre Metal & Wood Enamel.
 - 2. Duron, Inc.; 33-010 Dura Clad Alkyd White Primer.
 - 3. The Sherwin-Williams Co.; Kem Kromik Universal Metal Primer.
- B. Exterior Acrylic Galvanized Metal Primer:
 - 1. Benjamin Moore & Co.; M04 IMC Acrylic Metal Primer.
 - 2. Duron, Inc.; 33-105 Dura Clad Universal Acrylic Metal Primer. (80 g/l)
 - 3. The Sherwin-Williams Co.; B50WZ30 Galvite HS Metal Primer.

3.09 EXTERIOR FINISH COATS

- A. Satin Acrylic Finish Coats for Concrete, Stucco, Concrete Masonry Units, Gypsum Soffit Board, Wood, Hardboard Siding:

1. Benjamin Moore & Co.; N185 Moorcraft Super Spec 100% Acrylic Latex Low Lustre House Paint.
 2. Duron, Inc.; 11 Series Weather Shield Exterior Acrylic Satin Paint.
 3. The Sherwin Williams Co.; A82 Series A-100 Exterior Acrylic Latex Satin Paint.
- B. Semi-Gloss Acrylic Finish Coats for Ferrous and Galvanized Metals:
1. Benjamin Moore & Co. IMC M29 DTM Acrylic Semi-Gloss Enamel..
 2. Duron, Inc.; Dura Clad DTM Acrylic Coating, Semi-gloss, 95 series.
 3. The Sherwin-Williams Co.; B66-200 Series DTM Acrylic Coating, Semi-Gloss.
- 3.10 INTERIOR PRIMERS, SEALERS, AND FILLERS
- A. Interior Acrylic Primer for Gypsum Board:
1. Benjamin Moore & Co.; 231 EcoSpec Interior Latex Primer Sealer. (0 g/l)
 2. Duron, Inc.; 71-218 American Paints Terminator 2 Primer/Sealer. (45 g/l)
 3. The Sherwin-Williams Co.; B11W900 Harmony Interior Latex Primer. (0 g/l)
- B. Interior Acrylic Primer for Ferrous Metal:
1. Benjamin Moore & Co.; M04 IMC Acrylic Metal Primer. (54 g/l)
 2. Duron, Inc.; 33-105 Dura Clad Universal Acrylic Metal Primer. (80 g/l)
 3. The Sherwin-Williams Co.; B66W1 Direct To Metal Acrylic Primer & Finish. (138 g/l)
- C. Interior Acrylic Primer for Galvanized Metal:
1. Benjamin Moore & Co.; M04 IMC. Acrylic Metal Primer. (54 g/l)
 2. Duron, Inc.; 33-100 Dura Clad Acrylic Galvanized Metal Primer. (150 g/l)
 3. The Sherwin-Williams Co.; B66W1 DTM Primer/Finish. (138 g/l)
- D. Filler for Wood and trim: Putty or wood filler compatible with subsequent coatings. Color to match wood and provide uniform finish color.
- E. Interior Acrylic Primer for Wood:
1. Benjamin Moore & Co.; 231 Eco Spec Interior Latex Primer Sealer. (0 g/l)
 2. Duron, Inc.; 71-218 American Paints Terminator 2 Primer/Sealer (45 g/l).
 3. The Sherwin-Williams Co.; B11W900 Harmony Interior Latex Primer. (0 g/l)
- 3.11 INTERIOR FINISH COATS
- A. Eggshell (All non-wet areas) Acrylic Finish Coats for Concrete, Plaster, Concrete Masonry Units, Gypsum Board, Wood:
1. Benjamin Moore & Co.; 223 Eco Spec Interior Latex Eggshell Enamel. (0 g/l)
 2. Duron, Inc.; 79 Series Genesis Odor-Free Interior Latex Eggshell Enamel. (0 g/l)
 3. The Sherwin-Williams Co.; B9 Series Harmony Latex Eg-Shel (0 g/l).
- C. Semi-Gloss (Kitchen, bathrooms and storage) Acrylic Finish Coats for Concrete, Plaster, Concrete Masonry Units, Gypsum Board, Wood:
1. Benjamin Moore & Co.; 224 Eco Spec Interior Latex Semi-Gloss Enamel. (0 g/l)
 2. Duron, Inc.; 83 Series Genesis Odor-Free Interior Acrylic Latex Semi-Gloss Enamel. (0 g/l)
 3. The Sherwin Williams Co.; B10 Series Harmony Interior Latex Semi-Gloss. (0 g/l)
- D. Semi-Gloss Acrylic Finish Coats for Ferrous Metal:
1. Benjamin Moore & Co.; IMC M29 DTM Acrylic Semi-Gloss Enamel. (207 g/l)
 2. Duron, Inc.; Dura Clad DTM Acrylic Coating, Semi-gloss, 95 series. (209 g/l)
 3. The Sherwin-Williams Co.; B66-200 Series DTM Acrylic Coating, Semi Gloss. (208 g/l)



Renovations and Additions
North Main Annex

April 27, 2022

Bid Set

- E. Semi-Gloss Acrylic Finish Coats for Galvanized Metal:
 - 1. Benjamin Moore & Co.; IMC M29 DTM Acrylic Semi-Gloss Enamel. (207 g/l)
 - 2. Duron, Inc.; Dura Clad DTM Acrylic Coating, Semi-gloss, 95 series. (209 g/l)
 - 3. The Sherwin-Williams Co.; B66-200 DTM Series Acrylic Coating, Semi Gloss. (208 g/l)
- F. Satin Polyurethane Finish Coat for Wood Trim:
 - 1. Benjamin Moore & Co.; 423 Benwood Stays Clear Acrylic Polyurethane Low Lustre Finish. (283 g/l)
 - 2. Duron, Inc.; Minwaax Polycrylic Satin Finish.
 - 3. The Sherwin-Williams Co.; A68F90 Wood Classics Waterborne Polyurethane Satin Varnish. (309 g/l)

3.14 PAINT SYSTEMS - EXTERIOR

- A. Ferrous Metals:
 - 1. First Coat: Alkyd ferrous metal primer.
 - 2. Two Top Coats: Semi-gloss acrylic finish.
- B. Galvanized Metal:
 - 1. First Coat: Acrylic galvanized metal primer.
 - 2. Two Top Coats: Semi-gloss acrylic finish.

3.15 PAINT SYSTEMS - INTERIOR

- A. Ferrous Metals:
 - 1. First Coat: Primer.
 - 2. Two Top Coats: Semi-gloss acrylic finish.
- B. Galvanized Metal:
 - 1. First Coat: Acrylic primer.
 - 2. Two Top Coats: Semi-gloss acrylic finish.
- C. Gypsum Board:
 - 1. First Coat: Acrylic primer.
 - 2. Two Top Coats: Eggshell acrylic enamel finish.
- D. Gypsum Board Ceilings:
 - 1. First Coat: Acrylic primer.
 - 2. Two Top Coats: Flat latex paint finish.
- E. Wood Trim, and Panel Backers, Painted:
 - 1. First Coat: Primer.
 - 2. Two Top Coats: Semi-gloss acrylic finish.

END OF SECTION

| FOR CONSTRUCTION | |
|-----------------------|---------|
| PROJECT NUMBER: | 2014 |
| PROJECT DATE: | 4/27/14 |
| DRAWN BY: | MJC |
| APPROVED BY: | |
| SCHEDULE OF REVISIONS | |
| # | DATE |
| | |
| | |
| | |
| | |

| |
|-------------|
| FLOORPLAN |
| A1.0 |



- LVT
- CARPET TILE
- PORCELAIN TILE
- SOLID SURFACE COUNTERTOP

① COMPOSITE FLOOR PLAN
REV 1/14



SECTION 10 4413 - FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

1.2.1 Section Includes:

- 1.2.1.1 Fire protection cabinets for the following:

- 1.2.1.1.1 Portable fire extinguishers.

1.2.2 Related Sections:

- 1.2.2.1 Division 09 painting Sections for field painting fire protection cabinets.
- 1.2.2.2 Division 10 Section "Fire Extinguishers."

1.3 SUBMITTALS

- 1.3.1 Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire protection cabinets.

- 1.3.1.1 Fire Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

- 1.3.2 Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

- 1.3.3 Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

- 1.3.3.1 Size: 6 by 6 inches square.

- 1.3.4 Product Schedule: For fire protection cabinets. Coordinate final fire protection cabinet schedule with fire extinguisher schedule to ensure proper fit and function.

- 1.3.5 Maintenance Data: For fire protection cabinets to include in maintenance manuals.



1.4 QUALITY ASSURANCE

1.4.1 Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

1.5 COORDINATION

1.5.1 Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

1.5.2 Coordinate sizes and locations of fire protection cabinets with wall depths.

1.6 SEQUENCING

1.6.1 Apply decals or vinyl lettering on field-painted, fire protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1.1 Manufacturer's standard steel sheet.

2.2 FIRE PROTECTION CABINET

2.2.1 Cabinet Type: Suitable for fire extinguisher.

2.2.1.1 Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

- 2.2.1.1.1 Fire End & Croker Corporation;.
- 2.2.1.1.2 J. L. Industries, Inc., a division of Activar Construction Products Group;.
- 2.2.1.1.3 Kidde Residential and Commercial Division, Subsidiary of Kidde plc;.
- 2.2.1.1.4 Larsen's Manufacturing Company;.
- 2.2.1.1.5 Modern Metal Products, Division of Technico Inc.;.
- 2.2.1.1.6 Moon-American;.
- 2.2.1.1.7 Potter Roemer LLC;.
- 2.2.1.1.8 Watrous Division, American Specialties, Inc.;.

2.2.2 Cabinet Construction: 1-hour fire rated.

2.2.2.1 Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.0428-inch- thick, cold-rolled steel sheet lined with minimum 5/8-inch-thick, fire-barrier material. Provide factory-drilled mounting holes.

2.2.3 Cabinet Material: Steel sheet.

2.2.4 Semi-recessed Cabinet: Cabinet box partially recessed in walls of sufficient depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend). Provide where walls are of insufficient depth for recessed cabinets but are of sufficient depth to accommodate semi-recessed cabinet installation.

2.2.4.1 Rolled-Edge Trim: 2-1/2-inch backbend depth.

2.2.5 Cabinet Trim Material: Same material and finish as door.

2.2.6 Door Material: Steel sheet.

2.2.7 Door Style: Flush opaque panel, frameless, with no exposed hinges.

2.2.8 Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

2.2.8.1 Provide recessed door pull and friction latch.

2.2.8.2 Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

2.2.9 Accessories:

2.2.9.1 Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

2.2.9.2 Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.

2.2.9.3 Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.

2.2.9.4 Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.

2.2.9.4.1 Identify fire extinguisher in fire protection cabinet with the words "FIRE EXTINGUISHER."

2.2.9.4.1.1 Location: Applied to cabinet door.

2.2.9.4.1.2 Application Process: Etched.

2.2.9.4.1.3 Lettering Color: Black.

2.2.9.4.1.4 Orientation: Vertical.

2.2.10 Finishes:

2.2.10.1 Manufacturer's standard baked-enamel paint for the following:

2.2.10.1.1 Exterior of cabinet, door, and trim except for those surfaces indicated to receive another finish.

2.2.10.1.2 Interior of cabinet and door.

2.2.10.2 Steel: Factory primed for field painting.

2.3 FABRICATION

2.3.1 Fire Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

2.3.1.1 Weld joints and grind smooth.

2.3.1.2 Provide factory-drilled mounting holes.

2.3.1.3 Prepare doors and frames to receive locks.

2.3.1.4 Install door locks at factory.

2.3.2 Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.

2.3.2.1 Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.

2.3.2.2 Miter and weld perimeter door frames.

2.3.3 Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

2.4.1 Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.4.2 Protect mechanical finishes on exposed surfaces of fire protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

2.4.3 Finish fire protection cabinets after assembly.

2.4.4 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.

2.5 STEEL FINISHES

2.5.1 Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning".

2.5.2 Factory Prime Finish: Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

2.5.2.1 Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- 3.1.1 Examine walls and partitions for suitable framing depth and blocking where semi-recessed cabinets will be installed.
- 3.1.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- 3.2.1 Prepare recesses for semi-recessed fire protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- 3.3.1 General: Install fire protection cabinets in locations and at mounting heights indicated [or, if not indicated, at heights indicated below:] [or, if not indicated, at heights acceptable to authorities having jurisdiction.]
 - 3.3.1.1 Fire Protection Cabinets: 54 inches above finished floor to top of cabinet.
- 3.3.2 Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 3.3.2.1 Unless otherwise indicated, provide recessed fire protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semi-recessed fire protection cabinets.
 - 3.3.2.2 Provide inside latch and lock for break-glass panels.
 - 3.3.2.3 Fasten mounting brackets to inside surface of fire protection cabinets, square and plumb.
 - 3.3.2.3.1 Install cabinet with not more than 1/16-inch tolerance between pipe OD and knockout OD. Center pipe within knockout.
 - 3.3.2.3.2 Seal through penetrations with firestopping sealant as specified in Division 07 Section "Penetration Firestopping."
- 3.3.3 Identification: Apply decals at locations indicated.

3.4 ADJUSTING AND CLEANING

- 3.4.1 Remove temporary protective coverings and strippable films, if any, as fire protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- 3.4.2 Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- 3.4.3 On completion of fire protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- 3.4.4 Touch up marred finishes, or replace fire protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire protection cabinet and mounting bracket manufacturers.
- 3.4.5 Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 4413



SECTION 10 4416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- 1.2.1 Section includes portable, hand-carried fire extinguishers.

- 1.2.2 Related Sections:

- 1.2.2.1 Division 10 Section "Fire Extinguisher Cabinets."

1.3 SUBMITTALS

- 1.3.1 Product Data: For each type of product indicated. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher.
- 1.3.2 Product Schedule: For fire extinguishers. Coordinate final fire extinguisher schedule with fire protection cabinet schedule to ensure proper fit and function.
- 1.3.3 Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.
- 1.3.4 Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

- 1.4.1 NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- 1.4.2 Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 - 1.4.2.1 Provide fire extinguishers approved, listed, and labeled by FMG.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

1.5 COORDINATION

1.5.1 Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.6 WARRANTY

1.6.1 Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1.6.1.1 Failures include, but are not limited to, the following:

1.6.1.1.1 Failure of hydrostatic test according to NFPA 10.

1.6.1.1.2 Faulty operation of valves or release levers.

1.6.1.2 Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

2.1.1 Fire Extinguishers: Type, size, and capacity for each fire protection cabinet indicated.

2.1.1.1 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:

2.1.1.1.1 Amerex Corporation.

2.1.1.1.2 Ansul Incorporated; Tyco International Ltd.

2.1.1.1.3 Badger Fire Protection; a Kidde company.

2.1.1.1.4 Buckeye Fire Equipment Company.

2.1.1.1.5 Fire End & Croker Corporation.

2.1.1.1.6 J. L. Industries, Inc.; a division of Activar Construction Products Group.

2.1.1.1.7 Kidde Residential and Commercial Division; Subsidiary of Kidde plc.

2.1.1.1.8 Larsen's Manufacturing Company.

2.1.1.1.9 Moon-American.

2.1.1.1.10 Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.

2.1.1.1.11 Potter Roemer LLC.

2.1.1.1.12 Pyro-Chem; Tyco Safety Products.

2.1.1.2 Valves: Manufacturer's standard.

2.1.1.3 Handles and Levers: Manufacturer's standard.

2.1.1.4 Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

- 2.1.2 Clean-Agent Type in Aluminum Container: UL-rated 2-B:C, 2.5-lb nominal capacity, with HCFC Blend B agent and inert material in enameled-aluminum container; with pressure-indicating gage.

PART 3 - EXECUTION

3.1 EXAMINATION

- 3.1.1 Examine fire extinguishers for proper charging and tagging.

- 3.1.1.1 Remove and replace damaged, defective, or undercharged fire extinguishers.

- 3.1.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- 3.2.1 General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

- 3.2.1.1 Mounting Brackets: 54 inches above finished floor to top of fire extinguisher.

- 3.2.2 Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

END OF SECTION 10 4416



Renovations and Additions
North Main Annex

April 27, 2022
Bid Set

SECTION 12 4960- MOTORIZED ROLLER SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roller shades, motorized operation and accessories.
- B. Intelligent encoded electronic drive system
- C. Motor controls, interfaces, and accessories.
- D. Shade fabric.

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Wood blocking and grounds for mounting roller shades and accessories.
- B. Section 09260 - Gypsum Board Assemblies: Coordination with gypsum board assemblies for installation of shade pockets, closures and related accessories.
- C. Section 09510 - Acoustical Ceilings: Coordination with acoustical ceiling systems for installation of shade pockets, closures and related accessories.
- D. Division 16 - Electrical: Electric service for motor controls.

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. Business and Institutional Furniture Manufacturers Association (BIFMA):
 - 1. BIFMA HCF 8.1 - Health Care Furniture Design - Guidelines for Cleanability.
- C. Cradle to Cradle Products Innovation Institute (C2C):
 - 1. C2C (DIR) - C2C Certified Products Registry.
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
 - 2. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.
- E. Underwriters Laboratories (UL):
 - 1. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.
 - 2. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window

Operators and Systems; Current Edition, Including All Revisions.

F. Window Covering Manufacturers Association (WCMA):

1. WCMA A100.1 - Safety of Window Covering Products; 2018.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog pages and data sheets for products specified including materials, finishes, dimensions, profiles, mountings, and accessories.

1. Preparation instructions and recommendations.
2. Styles, material descriptions, dimensions of individual components, profiles, features, finishes, accessories, and operating instructions.
3. Storage and handling requirements and recommendations.
4. Mounting details and installation methods.
5. Manufacturer's Instructions: Include storage, handling, protection, examination, preparation, and installation.
6. Project Record Documents: Record actual locations of control system components and show interconnecting wiring.
7. Operation and Maintenance Data: Component list with part numbers, and operation and maintenance instructions.
8. Motorized Shades: Power requirements. Typical wiring diagrams including integration of EDU controllers with building management system, audiovisual and lighting control systems as applicable.
9. Motorized Shades: Power requirements. Typical wiring diagrams including integration of EDU controllers with building management system, audiovisual and lighting control systems as applicable.

1.6 QUALITY ASSURANCE

A. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

B. Manufacturer Qualifications: Obtain roller shades system through one source from a single manufacturer with a minimum of ten years experience and minimum of five projects of similar scope and size in manufacturing products comparable to those specified in this section.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver in factory-labeled packages, marked with manufacturer and product

name, fire-test-response characteristics, and location of installation using same room designations indicated on Drawings and in Window Treatment Schedule.

B. Store and handle products per manufacturer's recommendations.

1.10 WARRANTY

A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating warranty for interior shading.

1. Shade Hardware: 10 years unless otherwise indicated.
 - a. ElectroShade with ThermoVeil, EuroVeil, EuroTwill, Soho, Equinox, Midnite, Chelsea, or Classic Blackout shade fabric: 25 years.
2. Standard Shadecloth: Manufacturer's standard twenty-five year warranty.
4. Roller Shade Motors, Motor Control Systems, and Accessories: Manufacturer's standard non-depreciating five year warranty.
5. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas, which are deemed owners responsibility.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Mecho, which is located at: 42-03 35th St.; Long Island City, NY 11101; Tel: 718-729-2020; Fax: 718-729-2941; Email: [request info](mailto:requestinfo@mechoshade.com); Web: <http://www.mechoshade.com>

B. Substitutions: Basis of Design- Substitutions as approved by Architect

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 ROLLER SHADES, MOTORIZED OPERATION AND ACCESSORIES

A. Shade System; General:

1. Motorized Shades: Comply with NFPA 70.
2. Components capable of being removed or adjusted without removing mounted shade brackets, cassette support channel, or _____.
3. Operates smoothly when raising or lowering shades.
4. Cradle-to-Cradle certified and listed in C2C (DIR).
5. Electrical Components: Listed, classified, and labeled as suitable for intended purpose. Test as total system. Individual component testing is

acceptable.

a. Components: FCC compliant where applicable.

- B. Basis of Design: ElectroShade with WhisperShade IQ2 EDU. As manufactured by Mecho. Motor operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
1. Voltage: 120 VAC
 2. Description: Single roller.
 3. Drop Position: Regular roll.
 4. Mounting: Ceiling mounted.
 5. Mounting: Window jamb mounted.
 6. Size: As indicated on drawings.
 7. Fabric: As indicated under Shade Fabric article.
 8. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - a. Material: Steel, 1/8 inch (3 mm) thick.
 - 3) Room-Darkening Fabric: Room-side of opening.
 - c. Multiple Shade Operation: Provide hardware as necessary to operate more than one shade using a single motor.
 9. Roller Tubes:
 - a. Material: Extruded aluminum.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 10. Hembars: Designed to maintain bottom of shade straight and flat.
 - a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
 - 1) Profile: Rectangular.
 - 2) Color: To be selected from manufacturer's standard color selection.
 - b. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
 11. Accessories:
 - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
 - 1) Finish: Baked enamel.

- 2) Color: Black.
 - 3) Profile: Square.
 - 4) Configuration: Captured, fascia stops at captured bracket end.
- b. Ceiling Pockets: Premanufactured metal shade pocket with removable closure panel, for recess mounting in acoustical tile or drywall ceilings; size and configuration as indicated on drawings.

2.3 INTELLIGENT ENCODED ELECTRONIC DRIVE SYSTEM

A. Electronic Drive Unit (EDU) System General Requirements:

1. UL 325 listed solution.
 - a. Component certification in lieu of system testing is not acceptable.
2. Listing Label and Motor Rating: To be visible for inspection without dismounting of shade assembly to remove motor or EDU from shade roller tube.
3. Size and Configuration: As recommended by manufacturer for type, size, and arrangement of shades.
4. Conceal EDU inside shade roller tube.
5. EDU Rated Speed: The same nominal speed for shades in the same room.
6. Hanging Weight of Shade Band: 80 percent of rated lifting capacity of shade EDU and tube assembly.
7. Capable of upgrading firmware from anywhere on network without touching the motor.

B. Line Voltage EDU (120 VAC):

1. Basis of Design: Mecho; WhisperShadeIQ2 System. Tubular, asynchronous, integral AC motor and reversible capacitor. 120 VAC, single phase, 60 Hz; temperature Class B, thermally-protected, totally enclosed, maintenance-free. Powered by line voltage power supply connection equipped with locking disconnect plug assembly furnished with EDU.
2. Audible Noise: 46 dBA measured 3 ft (914 mm) from motor unit, depending on motor torque.
3. Nominal Speed: 34 RPM. Not to vary due to load/lift capacity.
4. Isolated, low voltage power supply for powering external accessories connected to either the dry contact or network port.
 - a. Products requiring accessories to be powered by a plug-in or externally-supplied power supply are not acceptable.

D. Modes of Operation:

1. Uniform Mode: Shades move to defined intermediate stop positions in order to maintain aesthetic uniformity.

2. Normal Mode: Shades move to defined intermediate stop positions and any position between defined upper and lower limits.
3. Maintenance Mode: Prevents shade from moving via dry contact or network control commands mode has been cleared/disabled.

2.4 MOTOR CONTROLS, INTERFACES, AND ACCESSORIES

- A. Unless indicated to be excluded, provide required equipment as necessary for a complete operating system providing the control intent specified. Provide components and connections necessary to interface with other systems as indicated.

2.5 ROLLER SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch (13 mm) [] space between bottom bar and window stool [finished floor] [window stool] [].
 2. Horizontal Dimensions: Inside Mounting.
 - a. Fill openings from jamb to jamb.

2.6 SHADE FABRIC

- A. Basis of Design: Shade fabric as manufactured by Mecho.
 1. Blackout Shadecloths:
 - a. Fabric: Equinox Blackout: 0200 series. Opaque.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.

- B. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- C. Coordinate with window installation and placement of concealed blocking to support shades.

3.3 INSTALLATION

- A. Install shades level, plumb, square, and true per manufacturer's instructions and approved shop drawings. Locate so shade band is at least 2 inches (51 mm) from interior face of glass. Allow proper clearances for window operation hardware. Use mounting devices as indicated.
- B. Replace shades exceeding specified tolerances at no extra cost to Owner.
- C. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric.
- D. Clean roller shade surfaces after installation, per manufacturer's written instructions.
- E. Demonstrate operation and maintenance of window shade system to Owner's personnel.
- F. Manufacturer's authorized personnel are to train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as a reference, supplemented with additional training materials as required.

3.4 SYSTEM STARTUP

- A. Motorized Shade System: Provide services of a manufacturer's authorized representative to perform system startup.

3.5 PROTECTION AND CLEANING

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
 - 1. Clean soiled shades and exposed components as recommended by manufacturer.
 - 2. Replace shades that cannot be cleaned to "like new" condition.

3.6 MAINTENANCE



Renovations and Additions
North Main Annex

April 27, 2022

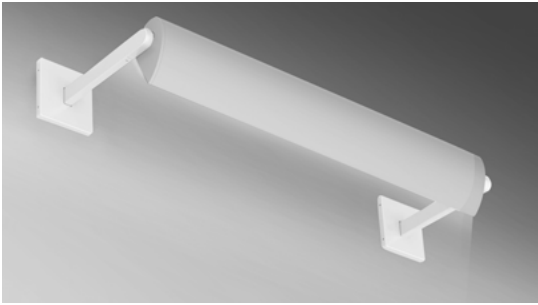
Bid Set

- A. Provide Owner a proposal as an alternate to the base bid and at no extra cost, a separate renewable maintenance contract for service and maintenance of motorized shade system.
 - 1. Include a complete description of preventive maintenance, systematic examination, adjustment, parts and labor, cleaning, and testing, with a detailed schedule.
 - a. Contract Duration: One year from date of Substantial Completion.

END OF SECTION

AXLE LED

WALL ASYMMETRIC DIRECT



DESCRIPTION

Axle is an elegant and compact LED linear accent luminaire providing efficient asymmetric light distribution. Softly curved, Axle measures just 2 11/16" by 3 11/16". With adjustable optics, light output from 350 to 1200 lumens per foot (nominal), and efficacy up to 126 LPW, Axle delivers smooth, effective direct illumination. Highly flexible, Axle can be installed as individual luminaires (up to 8') or in continuous runs. LED boards and on-board driver are accessible without removing the luminaire.

PROJECT: _____

TYPE: _____

NOTES: _____

ORDER GUIDE

up to 126 lm/w performance

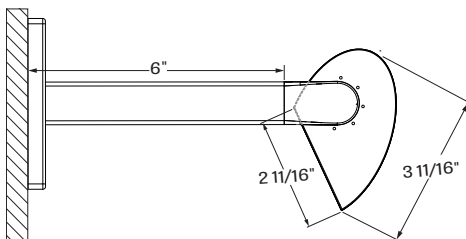
| AXLWAD | | LED | | | |
|---|---|-----------------------------------|--|---|--|
| LUMINAIRE ID | OPTICS | LIGHT SOURCE | CRI | LUMEN PACKAGES | COLOR TEMP. |
| AXLWAD - Axle wall asymmetric direct | APO - Adjustable Asymmetric Projecting Optic BAF - white baffles overlay | LED - high performance LED | 80 - 80CRI 90 - 90CRI | 350 - min. eco low output 350lm/ft 550 - low output 550lm/ft 750 - medium output 750lm/ft 950 - high output 950lm/ft 1200 - max. ultra high output 1200lm/ft #### - other required lm/ft | 27 - 2700k 30 - 3000k 35 - 3500k 40 - 4000k |

| LUMINAIRE LENGTH | VOLTAGE | DRIVER | ELECTRICAL |
|---|---|--|--|
| Standard sections - 2', 3', 4', 5' & 8' For all other specify length #FT - nominal length in feet #IN - length in inches | 120 - 120V 277 - 277V UNV - 120V-277V 347 - 347V (not available with Lutron) | D1 - 1% dimming 0-10V DA - Dali LTEA2W - Lutron 1% - 2 wire FF 120V LDE1 - Lutron Hi-lume 1% Eco LDE5 - Lutron 5% EcoSystem | 1 - 1 circuit +EB - emergency battery (min 4' fixture, except Lutron) +EM - emergency light circuit +NL - night light circuit |

See page 2 for ordering code detailed information

| MOUNTING | MOUNTING PLATE | FINISH | OPTIONS |
|--|--|---|--------------------|
| ARM6 - Cantilever arm 6" ARM12 - Cantilever arm 12" ARM18 - Cantilever arm 18" ARM## - Cantilever arm custom length (max 24") | 55W - 5" by 5" white plate 55AL - 5" by 5" aluminum plate | W - matte white AL - aluminum CF# - custom finish specify RAL# | CU - custom |

CROSS SECTION



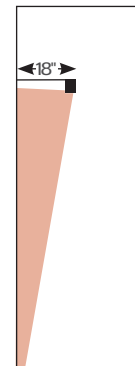
AXLWAD - 6" cantilever arm

OPTICS



APO - Asymmetric Projecting Optics

LIGHT DISTRIBUTION



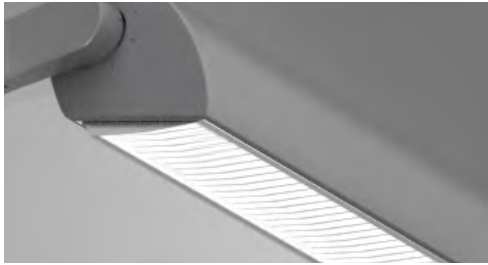
With an 18" arm

OPTICS

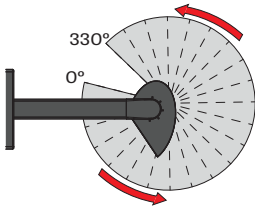
ASYMMETRIC PROJECTING OPTIC (APO) -

Cartridge-mounted, linear LED arrays are paired with precisely formed semi-specular reflector for smooth light distribution and a 95° beam spread. The LED array is protected by a clear acrylic cover. In a direct orientation, peak intensity occurs at 30° below nadir with a peak-to-zenith intensity ratio of 5.2:1.

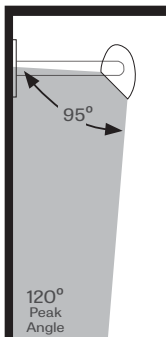
OPTIONAL BAFFLES (BAF) - Optional die-formed sheet metal white baffle with blades spaced 0.5" apart provides lateral shielding and can be field-installed.



Field-Adjustable Aiming (15 options)



The Axle housing can be field-rotated to provide either indirect (ceiling) or direct illumination. Detents in 15° increments permit precise aiming.



LIGHT SOURCE - LED

Custom linear array of mid-flux LED's are cartridge-mounted to facilitate service and thermal management. Available in 3000K, 3500K and 4000K with a minimum 80 CRI and an option for 90 CRI with elevated R9 value. Color consistency are maintained to within 3 SDCM. LEDs operate at reduced drive current to optimize efficacy and lumen maintenance.

All LEDs have been tested in accordance with IESNA LM-80-08 and the results have shown L80 lumen maintenance greater than 60,000 hours. Absolute product photometry is measured and presented in accordance with IESNA LM-79, unless otherwise indicated.

PERFORMANCE PER 4' AT 4000K - APO

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|-------------------|------------|-------|--------------------------|--------------|
| eco low output | 4000K | 11 | 1400 | 125 |
| low output | 4000K | 17.5 | 2200 | 126 |
| medium output | 4000K | 24.5 | 3000 | 123 |
| high output | 4000K | 31.4 | 3800 | 121 |
| ultra high output | 4000K | 40.5 | 4800 | 119 |

LIGHT DISTRIBUTION



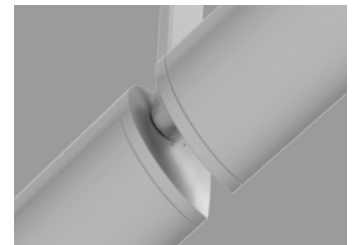
AXLWAD-APO-LED-80-350-40-20FT
Luminaire Watts = 58W (for 20Ft)
Ceiling Height = 10ft
Length of Wall = 20ft
Arm Bracket = 18 inches

Foot Candles on 20' length wall

| | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|
| 13.7 | 14.6 | 15.3 | 14.6 | 14.6 | 14.6 | 14.6 | 15.2 | 14.4 | 12.9 |
| 74.3 | 85.3 | 87.2 | 86.8 | 86.8 | 86.8 | 86.8 | 87.1 | 85.1 | 73.4 |
| 34.5 | 41.6 | 43.7 | 44.1 | 44.2 | 44.2 | 44.1 | 43.6 | 41.5 | 33.5 |
| 9.9 | 11.5 | 12.4 | 12.8 | 12.9 | 12.9 | 12.8 | 12.4 | 11.4 | 9.5 |
| 4.5 | 5.1 | 5.5 | 5.8 | 5.8 | 5.8 | 5.7 | 5.5 | 5.0 | 4.3 |

LUMINAIRE LENGTH

Axle is available in individual lengths up to 8'. The mounting hub provides connections for installation in continuous rows, allowing each luminaire to be aimed independently.

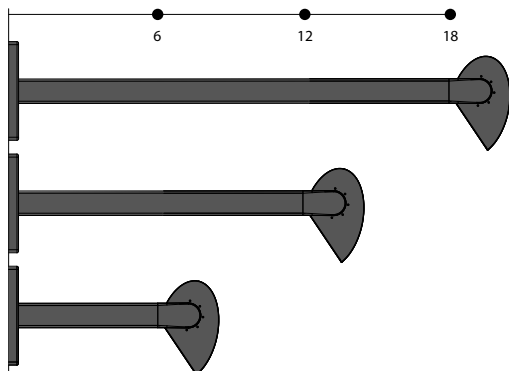


ELECTRICAL

Factory-set, adjustable output current LED driver with universal (120-277VAC) input. Dimmable from 100% to 1% with 0-10V dimming control. Rated life (90% survivorship) of 50,000 hours at 50°C max. ambient (and 70°C max. case) temperature. At maximum driver load: Efficiency>84%, PF>0.9, THD<20%. Other specifiable options include Lutron Hi-Lume 1% (specify 2-wire, or Ecosystem Dim-to-Off), Lutron 5-Series (5% Ecosystem), DMX (RDM compatible) and DALI protocol drivers. All of our standard 0-10V drivers are NEMA 410 compliant.

MOUNTING

Axle is wall mounted using fixed steel arms, 6", 12", or 18" long. Arm mounting provides concealed wiring and connects to outlet boxes using 4" square and round mounting plates and 4"x 2" plates are also available.



MOUNTING PLATES



5" x 5"

FINISH

Interior - Natural aluminium inner extrusion and 95%, reflective white brackets

Exterior - White or aluminum powder coating.

EMERGENCY

Factory installed long-life, high temperature, recyclable Ni-Cad battery pack with test switch and charge indicator, minimum of 90 minute operation, up to 1000 lumens per 4ft (25°C) emergency lighting output. Recharge time of 24 hours.

CONSTRUCTION

Housing - extruded aluminum 0.090" nominal thickness

Reflector - semi-specular anodised aluminum sheet 0.020"

Reflector bracket - extruded aluminum 0.090" nominal thickness / Natural finish)

Lens - Extruded Clear Acrylic 0.050" nominal thickness

Interior Brackets - 22 GA CRS / Painted White

End-caps - die-cast aluminum

Joiner - die-cast aluminum

Cantilever - rectangular cold rolled steel tube with welded mounting plate

Baffles - white sheet metal

MAINTENANCE

LED boards are removable from the cartridge for easy replacement. Both cartridge and driver are accessible without removing the luminaire.

WEIGHT

AXLE 4ft - 3.2Kg - 7lb

AXLE 8ft - 6.3Kg - 14lb

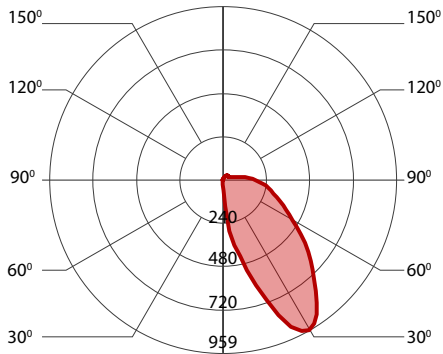
CERTIFICATIONS

ETL - Rated for Indoor Dry/Damp locations. Conforms to UL Standard 1598 and certified to CAN/CSA Standard C22.2 No. 250.0.

WARRANTY

LumenWerx provides a five-year limited warranty of electrical and mechanical performance of the luminaires, including the LED boards, drivers, and auxiliary electronics. LumenWerx will repair or replace defective luminaires or components at our discretion, provided they have been installed and operated in accordance with our specifications. Other limitations apply, please refer to the full warranty on our website.

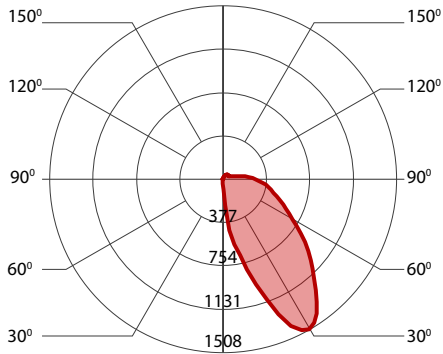
350 LUMEN AT 80CRI - ECO LOW OUTPUT



PERFORMANCE PER 4'

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|----------------|------------|-------|--------------------------|--------------|
| eco low output | 2700K | 11 | 1400 | 127 |
| eco low output | 3000K | 12 | 1400 | 117 |
| eco low output | 3500K | 11.5 | 1400 | 121 |
| eco low output | 4000K | 11 | 1400 | 125 |

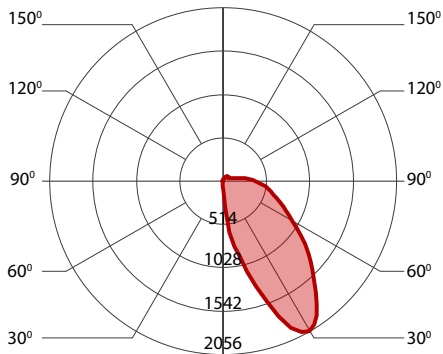
550 LUMEN AT 80CRI - LOW OUTPUT



PERFORMANCE PER 4'

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|------------|------------|-------|--------------------------|--------------|
| low output | 2700K | 18 | 2200 | 123 |
| low output | 3000K | 18.5 | 2200 | 118 |
| low output | 3500K | 18 | 2200 | 122 |
| low output | 4000K | 17.5 | 2200 | 126 |

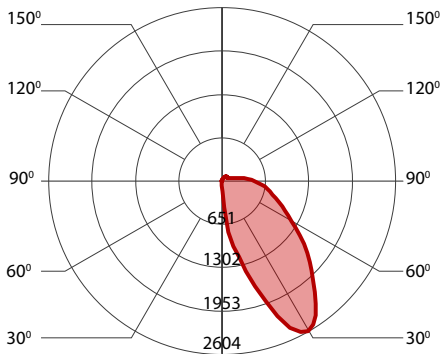
750 LUMEN AT 80CRI - MEDIUM OUTPUT



PERFORMANCE PER 4'

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|---------------|------------|-------|--------------------------|--------------|
| medium output | 2700K | 24 | 3000 | 126 |
| medium output | 3000K | 26 | 3000 | 115 |
| medium output | 3500K | 25 | 3000 | 119 |
| medium output | 4000K | 24.5 | 3000 | 123 |

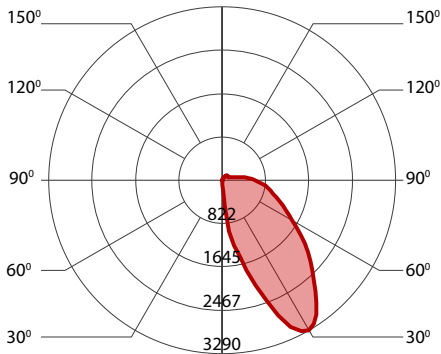
950 LUMEN AT 80CRI - HIGH OUTPUT



PERFORMANCE PER 4'

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|-------------|------------|-------|--------------------------|--------------|
| high output | 2700K | 31 | 3800 | 123 |
| high output | 3000K | 33.5 | 3800 | 113 |
| high output | 3500K | 32.5 | 3800 | 117 |
| high output | 4000K | 31.4 | 3800 | 121 |

1200 LUMEN AT 80CRI - ULTRA HIGH OUTPUT



PERFORMANCE PER 4'

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|-------------------|------------|-------|--------------------------|--------------|
| ultra high output | 2700K | 39.5 | 4800 | 121 |
| ultra high output | 3000K | 43 | 4800 | 111 |
| ultra high output | 3500K | 41.5 | 4800 | 115 |
| ultra high output | 4000K | 40.5 | 4800 | 119 |

RIM ROUND

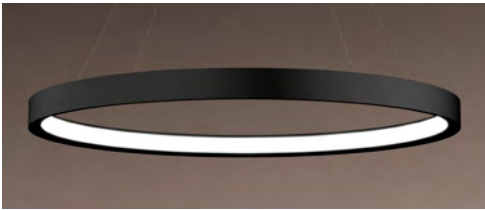
PENDANT
STATIC WHITE

LUMENWERX



Project: _____

Type: _____



Rim Round



Rim Verso Round

DESCRIPTION

Available in eight standard sizes, from 2' to 12' diameter, Rim Round fixtures are decorative with a sleek profile suitable in any interior environment, especially when combined with general lighting, wall wash, and/or perimeter effects. Standard Rim Round is equipped with LED arrays illuminating inward from its circular housing. In contrast, Rim Verso Round fixtures are equipped with LED arrays illuminating outward from their housing. Certain smaller Rim Round sizes can be combined (two to three fixtures only) to form Rim Multiple Round luminaires. Similarly, certain smaller Rim Round sizes can be vertically mounted and as such are known as Rim Air Round fixtures. Rim Round nominal light output ranges from 2000 to 24000 lumens. It is also available with Chromawerx Sola, Duo, and Quadro (consult factory).

Up to 95 lm/W performance

Order Guide

| LUMINAIRE ID | SIZE | OPTIC | | LIGHT SOURCE ³ | | CRI | LUMEN PACKAGE (lm) | | | COLOR TEMP. | VOLTAGE |
|---|---|--------------------------------|---|---------------------------|-------|-------|--------------------|--------|--|---|---------|
| | | ULO | SW | SW | 90 | | Low | Medium | High | | |
| RIMRP - Rim Round Pendant | 24 - 24" diameter 36 - 36" diameter | ULO - Uniform Lambertian Optic | SW - Static white ³ Chromawerx Sola, Duo and Quadro also available. Consult other spec sheet. | 90 - 90CRI | 24" | 2000 | 3000 | 4000 | 27 - 2700K 30 - 3000K 35 - 3500K 40 - 4000K | 120 - 120V 277 - 277V UNV - 120V-277V 347 ⁴ -347V | |
| RIMVRP - Rim Verso Round Pendant | 48 - 48" diameter 60 - 60" diameter 72 - 72" diameter 96 ^{1,2} - 96" diameter 120 ^{1,2} - 120" diameter 144 ^{1,2} - 144" diameter | | | | 36" | 3000 | 4500 | 6000 | | | |
| | | | | | 48" | 4000 | 6000 | 8000 | | | |
| | | | | | 60" | 5000 | 7500 | 10000 | | | |
| | | | | | 72" | 6000 | 9000 | 12000 | | | |
| | | | | | 96" | 8000 | 12000 | 16000 | | | |
| | | | | | 120" | 10000 | 15000 | 20000 | | | |
| | | 144" | 12000 | 18000 | 24000 | | | | | | |

⁴Available with DI driver only.

| REMOTE DRIVER ⁵ | ELECTRICAL ⁷ | MOUNTING | | | | FINISH | | | | | | | | | | |
|---|--|---|---|--|---|--|---|--|-------|----------------|-------|----------------|-------|----------------|-------|----------------|
| | 1C | | | | | | | | | | | | | | | |
| DI - 1% 0-10V DA ⁶ - DALI LTEA2W - Lutron 1% - 2 wire FP 120V LDEI ⁶ - Lutron Hi-Lume 1% Eco ELD1 - eldoLED 1% ECOdrive 0-10V ELDO - eldoLED0.1% SOLOdrive 0-10V ⁵ PoE (Power-over-Ethernet) compatible. Consult factory for details. ⁶ On-site commissioning is required. | 1C - 1 circuit ⁷ For other circuit configurations, consult factory. | DRIVER BOX ⁸ RCD ^{9,10} - Round canopy driver box RDB ¹¹ - Remote driver box | CANOPY FINISH W - White AL - Aluminum B - Black CF - Custom finish, specify RAL# | POWER POC - Integrated suspension power-over-aircraft cable BAC - Black power cord + aircraft cable WAC - White power cord + aircraft cable | MOUNTING POINTS SC ¹² - Single canopy MC ^{13,14} - Multiple canopies ¹² Available up to 60" only. ¹³ 3 Canopies for Rim 24", 4 canopies for all other sizes. ¹⁴ With the RCD option, the type of each canopy may differ based on the selected lumen package and driver options. Consult factory for details. | MOUNTING CABLE LENGTH ¹⁵ 18IN - 18" 24IN - 24" 36IN - 36" 48IN - 48" 60IN - 60" 72IN - 72" 96IN - 96" 120IN - 120" ##IN - Specify nominal length in inches | W - White AL - Aluminum B - Black CF - Custom finish, specify RAL# | | | | | | | | | |
| | | ⁸ For more information see page 4. ⁹ With single canopy option, not available for lumen packages over 6000lm (3500lm for Lutron driver options). ¹⁰ Not available with 347V. ¹¹ Multiple remote driver boxes may be necessary for lumen packages higher than 10000 lm. | | | | | | ¹⁵ For single canopy option, the minimum required mounting heights are (distance from ceiling to top of fixture in inches): | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Fixture size</th> <th>Minimum height</th> </tr> </thead> <tbody> <tr> <td>Ø 24"</td> <td>min height 15"</td> </tr> <tr> <td>Ø 36"</td> <td>min height 22"</td> </tr> <tr> <td>Ø 48"</td> <td>min height 29"</td> </tr> <tr> <td>Ø 60"</td> <td>min height 36"</td> </tr> </tbody> </table> | | | | | | | Fixture size | Minimum height | Ø 24" | min height 15" | Ø 36" | min height 22" | Ø 48" | min height 29" | Ø 60" | min height 36" |
| Fixture size | Minimum height | | | | | | | | | | | | | | | |
| Ø 24" | min height 15" | | | | | | | | | | | | | | | |
| Ø 36" | min height 22" | | | | | | | | | | | | | | | |
| Ø 48" | min height 29" | | | | | | | | | | | | | | | |
| Ø 60" | min height 36" | | | | | | | | | | | | | | | |

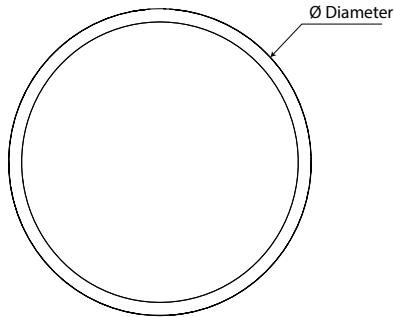
See website for the Pendant Mounting Guide

RIM ROUND

LUMENWERX

PENDANT
STATIC WHITE

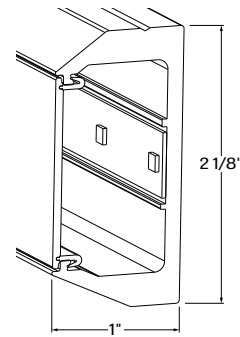
Dimensions



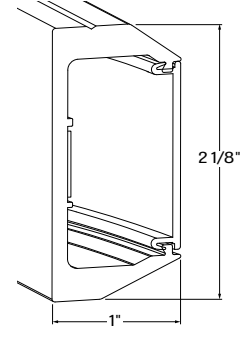
| Ø Diameter | | |
|------------|------------|-------|
| | ROUND | VERSO |
| 24 | Ø 24 1/4" | Ø 24 |
| 36 | Ø 35 5/8" | Ø 36" |
| 48 | Ø 48" | Ø 48" |
| 60 | Ø 60 7/16" | Ø 60" |
| 72 | Ø 72 5/8" | Ø 72" |
| 96 | Ø 96 5/8" | N/A |
| 120 | Ø 120 5/8" | N/A |
| 144 | Ø 144 5/8" | N/A |

RIMRP - Rim Round Pendant

SECTION VIEW



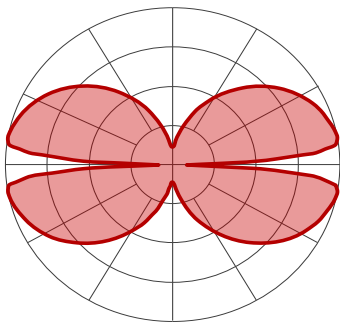
RIMRP - Rim Round Pendant



RIMVRP - Rim Verso Round Pendant

Photometrics

RIMRP - RIM ROUND PENDANT



Delivered lumens at 40K at 90 CRI

Multiplier @ CRI90

| CCT (K) | Watts | LPW |
|---------|-------|------|
| 2700 | 1.08 | 0.92 |
| 3000 | 1.05 | 0.96 |
| 3500 | 1.02 | 0.98 |
| 4000 | 1.00 | 1.00 |

24" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 22.2 | 2000 | 90 |
| Medium | 34.6 | 3000 | 87 |
| High | 47.7 | 4000 | 84 |

48" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 44.5 | 4000 | 90 |
| Medium | 69.2 | 6000 | 87 |
| High | 95.4 | 8000 | 84 |

72" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 66.7 | 6000 | 90 |
| Medium | 103.9 | 9000 | 87 |
| High | 143.2 | 12000 | 84 |

120" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 111.1 | 10000 | 90 |
| Medium | 173 | 15000 | 87 |
| High | 238.6 | 20000 | 84 |

36" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 33.4 | 3000 | 90 |
| Medium | 52 | 4500 | 87 |
| High | 71.7 | 6000 | 84 |

60" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 55.6 | 5000 | 90 |
| Medium | 86.2 | 7500 | 87 |
| High | 119.3 | 10000 | 84 |

96" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 88.9 | 8000 | 90 |
| Medium | 138.5 | 12000 | 87 |
| High | 190.9 | 16000 | 84 |

144" diameter

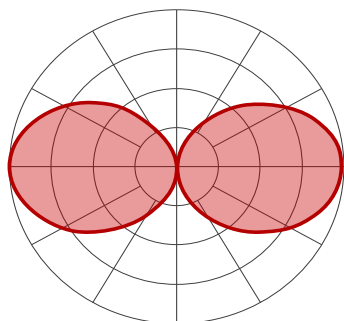
| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 13.3 | 12000 | 90 |
| Medium | 206.9 | 18000 | 87 |
| High | 285.7 | 24000 | 84 |

RIM ROUND

PENDANT
STATIC WHITE

LUMENWERX

RIMVRP - RIM VERSO ROUND PENDANT



Delivered lumens at 40K at 90 CRI

Multiplier @ CRI90

| CCT (K) | Watts | LPW |
|---------|-------|------|
| 2700 | 1.08 | 0.92 |
| 3000 | 1.05 | 0.96 |
| 3500 | 1.02 | 0.98 |
| 4000 | 1.00 | 1.00 |

24" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 21 | 2000 | 95 |
| Medium | 32.9 | 3000 | 91 |
| High | 45.3 | 4000 | 88 |

48" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 42.1 | 4000 | 95 |
| Medium | 65.7 | 6000 | 91 |
| High | 90.6 | 8000 | 88 |

72" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 63.2 | 6000 | 95 |
| Medium | 98.6 | 9000 | 91 |
| High | 135.9 | 12000 | 88 |

36" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 31.6 | 3000 | 95 |
| Medium | 49.5 | 4500 | 91 |
| High | 68.2 | 6000 | 88 |

60" diameter

| LED output | WATTS | NOMINAL DELIVERED LUMENS | LPW |
|------------|-------|--------------------------|-----|
| Low | 52.6 | 5000 | 95 |
| Medium | 82.1 | 7500 | 91 |
| High | 113.2 | 10000 | 88 |

RIM ROUND

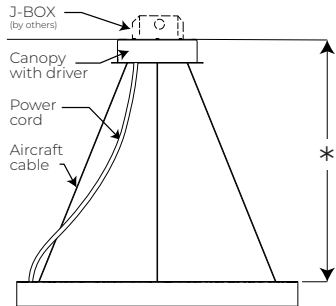
PENDANT
STATIC WHITE

LUMENWERX

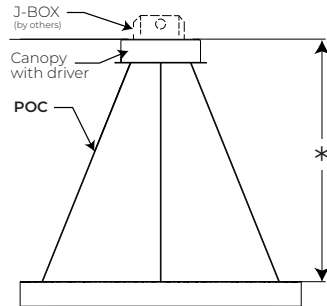
Mounting Options

RCD - ROUND CANOPY DRIVER BOX

SC - SINGLE CANOPY

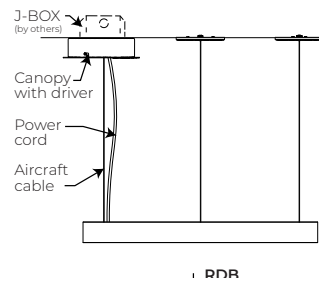


AC - Aircraft cable

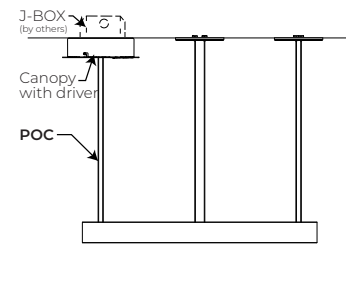


POC - Power-over-aircraft cable

MC - MULTIPLE CANOPY



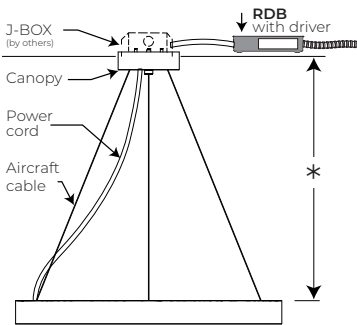
AC - Aircraft cable



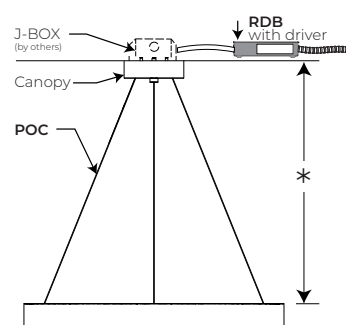
POC - Power-over-aircraft cable

RDB - REMOTE DRIVER BOX

SC - SINGLE CANOPY

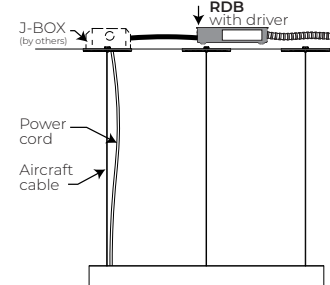


AC - Aircraft cable

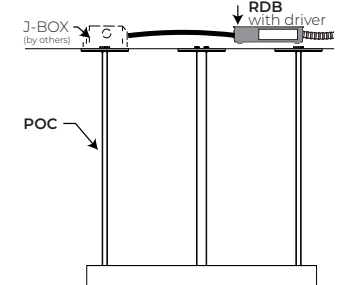


POC - Power-over-aircraft cable

MC - MULTIPLE CANOPY



AC - Aircraft cable



POC - Power-over-aircraft cable

*minimum height

For single canopy option, the minimum required mounting heights:

| Fixture size | * Minimum height |
|--------------|------------------|
| Ø 24" | min height 15" |
| Ø 36" | min height 22" |
| Ø 48" | min height 29" |
| Ø 60" | min height 36" |

RIM ROUND

LUMENWERX

PENDANT
STATIC WHITE

Technical Specifications

OPTIC

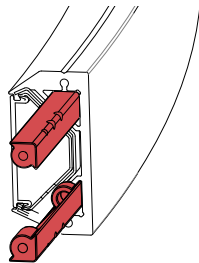
Uniform Lambertian Optic (ULO) - Thermoformed from impact-modified white PMMA, the ULO provides even luminosity, with up to 88% transmission. Combined with the LED array running around the inside of the housing, the open form and ULO create a widespread 50% direct and 50% indirect light distribution with spacing criteria of 1.6.

LIGHT SOURCE

Custom array of mid-flux LEDs are mounted directly to the housing for optimal thermal performance. Available in 2700K, 3000K, 3500K and 4000K with 90 CRI and elevated R9 value. Color consistency is maintained to 3 SDCM. LEDs are operated at a reduced drive current to optimize efficacy and lumen maintenance. All LEDs have been tested in accordance with IESNA LM-80-08 and results have shown L80 lumen maintenance are greater than 60,000 hours. Absolute product photometry is measured and presented in accordance with IESNA LM-79, unless otherwise indicated.

JOINER

For sizes that are shipped in separate pieces, all sections are joined together on site using pre-installed die cast joiners.



ELECTRICAL

Factory-set, adjustable output current LED driver with universal (120-277VAC) input. Dimmable from 100% to 1% with 0-10V dimming control. Rated life (90% survivorship) of 50,000 hours at 50°C max. ambient (and 70°C max. case) temperature. At maximum driver load: Efficiency > 84%, PF > 0.9, THD < 20%. Other specifiable options include Lutron Hi-Lume 1% (specify 2-wire, or Ecosystem Dim-to-Off), eldoLED 1% ECOdrive 0-10V, eldoLED 0.1% SOLOdrive 0-10V, and DALI protocol drivers. All of our standard 0-10V drivers are NEMA 410 compliant.

PoE

Depending on the PoE manufacturer selected, Lumenwerx will install the node in factory as either integral to the luminaire or as a remote module. Factory programming of the PoE node may or may not enable the following functionalities: lumen package, Duo (tunable white), Quadro (RGBW) emergency battery backup, and sensor integration. These must be addressed and evaluated on a case-by-case basis.

FINISH

Interior - 95% reflective, matte white powder coating
Exterior - Matte white, matte black or aluminum powder coating. Custom finishes are also available.

CONSTRUCTION

Housing - Rolled and seamlessly welded aluminum extrusion, wide variety of colored powder coating
Diffuser - Uniform Lambertian optic, co-extruded flexible polycarbonate satine finished lens

WEIGHT

Rim round 24 - 5lbs - 2.2kg
Rim round 36 - 7.5lbs - 3.4kg
Rim round 48 - 10lbs - 4.5kg
Rim round 60 - 12.5lbs - 5.6kg
Rim round 72 - 15lbs - 6.8kg
Rim round 96 - 20.1lbs - 9.1kg
Rim round 120 - 25.1lbs - 11.3kg
Rim round 144 - 30.1lbs - 13.6kg

CERTIFICATION

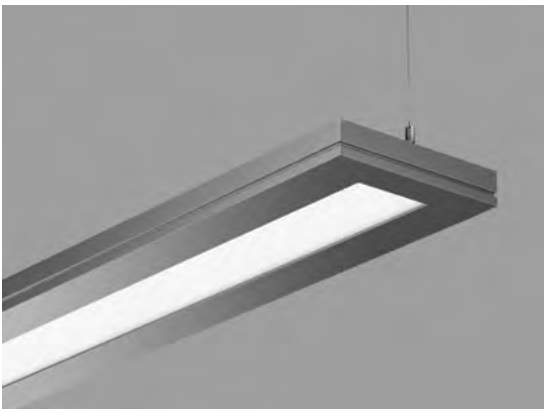
ETL - Rated for Indoor Dry/Damp locations. Conforms to UL Standard 1598 and certified to CAN/CSA Standard C22.2 No. 250.0.

WARRANTY

Lumenwerx provides a five-year limited warranty of electrical and mechanical performance of the luminaires, including the LED boards, drivers, and auxiliary electronics. Lumenwerx will repair or replace defective luminaires or components at our discretion, provided they have been installed and operated in accordance with our specifications. Other limitations apply, please refer to the full warranty on our website.

REVEN

PENDANT DIRECT/INDIRECT



Cable - shown with PMO optics

DESCRIPTION

Reven is a linear pendant and wall luminaire with a thin, articulated profile. Reven provides wide spread uplight and well controlled downlight. This highly efficient and comfortable illumination is offered in a wide range of light distributions together with comprehensive electrical and controls options. Please see additional specification sheets for LED and for Reven ICL with independently controllable light distribution, as well as other mounting arrangements.

PROJECT: _____

TYPE: _____

NOTES: _____

ORDER GUIDE

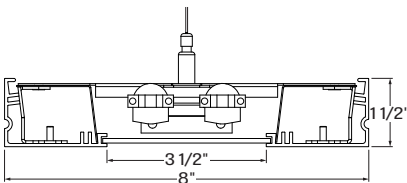
| REVP | PMO | | | | |
|----------------------|-----------------------------------|----------------------------------|--|---|--|
| LUMINAIRE ID | OPTICS | LIGHT SOURCE | NUMBER OF LAMPS | LIGHT DISTRIBUTION | LUMINAIRE LENGTH |
| REVP - reven pendant | PMO - precision micro-prism Optic | T5 - T5 lamp T5HO - T5HO lamp | 1 - 1 lamp 2 - 2 lamps 3 - 3 lamps | 80-20 - 80% down - 20% up 60-40 - 60% down - 40% up 30-70 - 30% down - 70% up | #FT - nominal length in feet Sections - 4', 8' and 12' only Continuous Run - for luminaires over 8' in multiples of 4' |

| VOLTAGE | BALLAST | ELECTRICAL | MOUNTING | FINISH |
|---|---|---|---|--|
| 120 - 120V 277 - 277V UNV - 120V-277V 347 - 347V (not available with Lutron) | RS - rapid start D - dimming 0-10V ST - step dimming DA - dali LHL - Lutron Hi-Lume 3D LEH - Lutron EcoSystem H LE - Lutron EcoSystem | 1 - 1 circuit 2 - 2 circuits + #EB - emergency battery (min 4' fixture, except Lutron) + #EM - emergency light circuit + #NL - night light circuit + #GTD### - generator transfer device, 120V or 277V | 53WAC36 - power 5" + non power 3" white canopy (36" air craft cable) 55WSW18 - power 5" + non power 5" white canopy & stem (18" stem) For all other options refer to our Pendant Mounting Guide | W - matte white AL - aluminum CF# - custom finish specify RAL# |

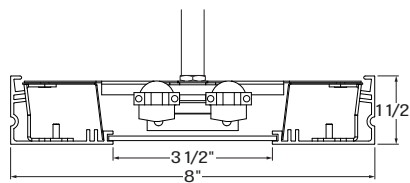
See page 2 for ordering code detailed information

| CONTROLS | OPTIONS |
|--|---|
| <u>INDIVIDUAL CONTROLS</u> OMS - Onboard Occupancy ODS - Onboard Daylight OCS - Onboard Occupancy & Daylight <u>GROUPED CONTROLS</u> LSC - Local system NSC - Network system | FU - fuse TB# - T-bar caddy clip specify grid size TG# - Tegular caddy clip specify grid size ST - Screw Slots caddy clip CU - custom |

CROSS SECTION



REVP - air craft cable



REVP - stem

OPTICS

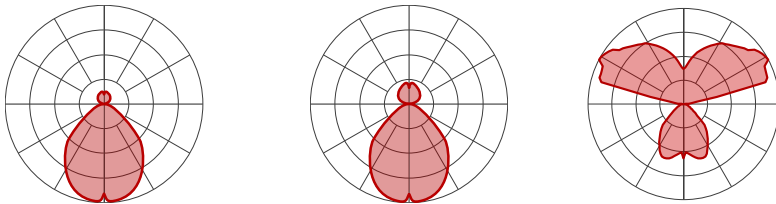


PMO - Precision Micro-prism Optic

OPTICS

PRECISION MICRO-PRISM-OPTIC (PMO) - precisely formed pyramidal prisms with a 0.06" square base provide outstanding control of high-angle brightness. Upper diffuser yields 70/30 indirect/direct distribution. The widespread upright provides a batwing distribution with peak intensity at 117° and a peak-to-zenith ratio of 2.7:1; shielding from the PMO optic provides 45° optical cut off. Upper reflectors create options for a higher downlight component. Reven is suitable for wide row spacing with a comfortable ceiling brightness gradient.

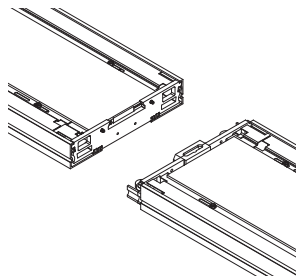
LIGHT DISTRIBUTION



80-20 - 80% down - 20%up **60-40** - 60% down - 40%up **30-70** - 30% down - 70%up

LUMINAIRE LENGTH

Reven is made up of standard 4, 8 and 12 foot sections only that may be joined together to create continuous run lengths. Nominal run length required must be noted in the product code. The minimum individual section available is 4 feet. All individual sections are joined together onsite using the joiner kits provided. LumenWerx offers joiner kits that are extremely simple to work with in the field and result in a fixture that appears virtually seamless with no light leak at any connection.



Joining system for Reven

ELECTRICAL

Universal input voltages with multiple control schemes offered. Consult factory for availability.

EMERGENCY

Factory installed long life high temperature recyclable Ni-Cad battery pack with test switch and charge indicator, minimum of 90 minutes operation. Recharge time of 24 hours.

MOUNTING OPTIONS

Fixtures can be pendant-mounted, using air craft cables, or stem-mounted.

Unless otherwise specified, LumenWerx provides the following hardware:

For cable-mounted fixtures - 53WAC36 (5" white canopy for all power mounting point, 3" white canopy for non power mounting point, and a 36" cable)

For stem mounted fixtures - 55WSW18 (5" white canopy for all power mounting point, and non power mounting point, and a 18" white stem)

Caddy clips, if required specify under **OPTIONS**

[For all other options, see our website for a detailed Pendant Mounting Guide](#)

FINISH

Interior - 95%, reflective matte powder coated white paint

Exterior - matte white or aluminum powder coating. Custom finishes are also available.

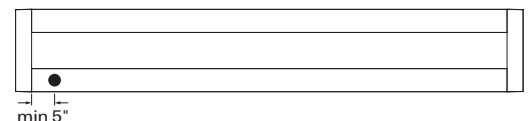
CONTROLS

LumenWerx offers several options for integrating occupancy and daylight controls. Whether a sensors control its own fixture or is part of a group of fixtures, lights can be automatically controlled according to different energy saving strategies. With **individual Controls**, an on-board sensor controls the fixture in which it is installed. Depending on the length, more than one sensor may be necessary and may control the entire fixture, or just a section.

With **Grouped Controls**, on-board or remote sensor are part of a either a local or network sensor infrastructure. It's possible to scale the controls, from a switch to a fixture setup, to a room or a whole building Occupancy and or daylight harvesting.

INDIVIDUAL CONTROLS

Individual controls are integrated into the fixture and are therefore easy to use and allow for a cleaner looking space as no ceiling or wall-mounted sensors are required. Individual controls can be one of three types (**OMS**) Occupancy, (**ODS**) Daylight Harvesting (Photocell), or (**OCS**) combined occupancy and daylight harvesting. These controls will be installed with factory settings, but most offer field adjustability with regular tools or manufacturer supplied configuration tools.



Location of an Onboard control

GROUPED CONTROLS

Local systems permit added flexibility and interconnectivity. Each fixture can now become part of a group of fixtures and be controlled by On-Board or remote sensors as well as wireless switches or controllers. With this architecture, it is now possible to have fewer fixtures with On-Board sensor which control all of the fixtures of the lighting zone. In order to have grouped controls programmed in factory, it is required that a floor layout with requested grouping and functionality be supplied. Field commissioning is also possible but must be requested and discussed before final Purchase Order is placed.

Network Controls, Lumenwerx fixtures are compatible with most popular BMS integration protocols such as DALI, DMX, EnOcean, BACnet, Enlighted and Lutron Ecosystem just to name a few. Field commissioning is usually required and details must be discussed before final Purchase Order is placed.

Please contact our controls department at controls@lumenwerx.com for further assistance.

CONSTRUCTION

Housing - Extruded Aluminum 0.075" nominal, matte white or aluminum powder coating. Custom finishes are also available.

End cap - Die cast Aluminum (0.95" nominal)

Joiners - male/female system made in Die cast Aluminum (0.95" nominal)

Interior brackets - Die formed cold rolled sheet steel 20 gauge thick

Reflectors - Flat rolled Aluminum sheet 0.040" thick precisely die formed, 95% reflective matte white painted

Hanger - Chromed Griplock securely attached with spring steel hardware in end caps and/or joiners

Air craft cable suspension - 7x7 braids Aluminum air craft cable 0.06" thick

Stem - 0.5" diameter threaded steel tube matte white or aluminum powder coating. Custom finishes are also available

WEIGHT

Reven 4 4ft - 9.91lbs - 4.5kg

Reven 4 8ft - 19.16lbs - 8.7kg

Reven 4 12ft - 28.41lbs - 12.9kg

CERTIFICATIONS

ETL - Rated for Indoor Dry/Damp locations. Conforms to UL Standard 1598 and certified to CAN/CSA Standard C22.2 No. 250.0.

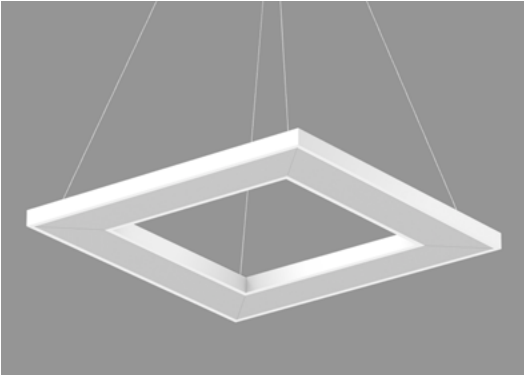
FORTEX 3 LED

PENDANT



LUMENWERX
WWW.LUMENWERX.COM

OUTWARD/INWARD LIGHT DISTRIBUTION



PROJECT: _____

TYPE: _____

NOTES: _____

DESCRIPTION

Fortex 3 is a series of distinctive and elegantly scaled rectangular pendants ideal for spaces such as conference rooms, executive offices, break rooms, cafeterias, vestibules and lobbies. Fortex 3 pendants consist of crisp 4.25" x 1.5" extruded aluminum sides, capped by gently glowing inward and outward optics that extend 0.5" beyond the housing. Corners are mitered and fully luminous. Fortex coordinates with Via 1.5 Plus linear luminaires.

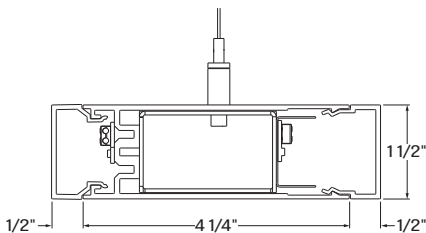
ORDER GUIDE

| FOR3POI | | HLO | LED | | | |
|---|---|---|-----------------------------------|--|--|--|
| LUMINAIRE ID | SIZE | OPTICS | LIGHT SOURCE | CRI | DIR/IND LUMEN PACKAGES | COLOR TEMP. |
| FOR3POI - fortex 3 pendant outward/inward light distribution | 18 - 18"x18" 33 - 3'x3' 44 - 4'x4' 14 - 1'x4' 34 - 3'x4' | HLO - High-Efficiency Lambertian Optic | LED - high performance LED | 80 - 80CRI 90 - 90CRI | 200 - min. ultra low output 200lm/ft 400 - max. low output 400lm/ft #### - other required lm/ft | 27 - 2700k 30 - 3000k 35 - 3500k 40 - 4000k |

| VOLTAGE | DRIVER | 1 | 5SWAC36 | | |
|--|--|---------------|--|---|--------------------|
| | | ELECTRICAL | MOUNTING | FINISH | OPTIONS |
| 120 - 120V 277 - 277V UNV - 120V-277V | D1 - 1% dimming 0-10V DA - Dali LTEA2W - Lutron 1% - 2 wire FF 120V LDE1 - Lutron Hi-lume 1% Eco LDE5 - Lutron 5% EcoSystem * 18"x18" is only available with dimming 0-10V | 1 - 1 circuit | 5SWAC36 - 5" square white canopy (36" air craft cable) For all other options refer to our Pendant Mounting Guide | W - matte white AL - aluminum CF# - custom finish specify RAL# | CU - custom |

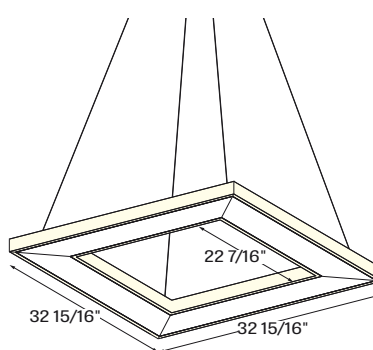
See page 2 for ordering code detailed information

SECTION VIEW



FOR3POI

3D VIEW



FOR3POI - 3'X3'

OPTICS



HLO - High-efficiency Lambertian Optic

FORTEX 3 LED

PENDANT

OUTWARD/INWARD LIGHT DISTRIBUTION

OPTICS

HIGH EFFICIENCY LAMBERTIAN OPTIC (HLO) - Matte white side reflectors combined with High-Efficiency Lambertian Optic (HLO) shielding of diffusing 0.075" thick acrylic with up to 88% transmission and good source obscuration. Luminaire brightness is controlled by the flux-to-shielding area ratio.

LIGHT SOURCE - LED

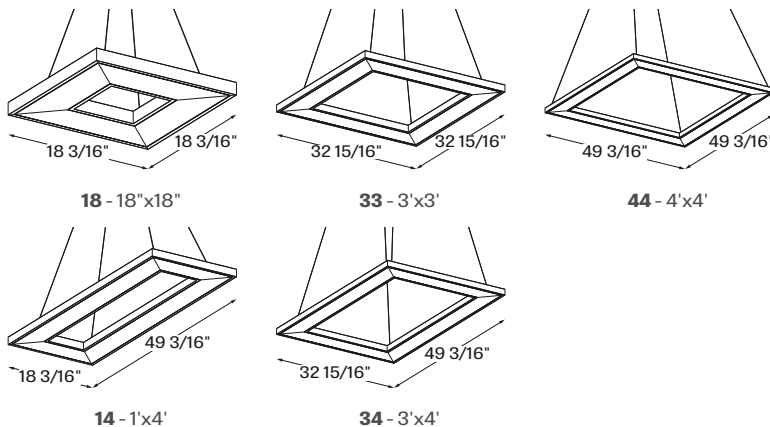
Custom linear array of mid-flux LED's are cartridge-mounted with quick-connect wiring to facilitate service and thermal management. Available in 3000K, 3500K and 4000K with a minimum 80 CRI and an option for 90 CRI with elevated R9 value. Color consistency maintained to within 3 SDCM. LEDs operated at reduced drive current to optimize efficacy and lumen maintenance. All LEDs have been tested in accordance with IESNA LM-80-08 and the results (following TM-21) have shown L80 lumen maintenance greater than 60,000 hours. Absolute luminaire photometry is measured and presented in accordance with IESNA LM-79, unless otherwise indicated.

PERFORMANCE PER 1' AT 4000K

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|---------------|------------|-------|--------------------------|--------------|
| low output | 4000K | 2.5 | 200 | 88 |
| medium output | 4000K | 4 | 400 | 97 |

LUMINAIRE SIZE

Fortex 3 is offered in 5 standard sizes.



ELECTRICAL

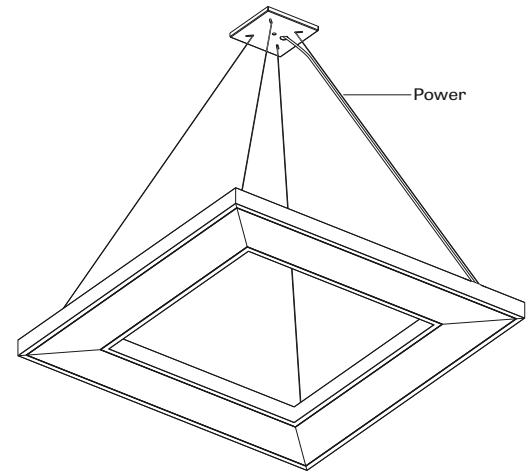
Factory-set, adjustable output current LED driver with universal (120-277VAC) input. Dimmable from 100% to 1% with 0-10V dimming control. Rated life (90% survivorship) of 50,000 hours at 50°C max. ambient (and 70°C max. case) temperature. At maximum driver load: Efficiency > 84%, PF > 0.9, THD < 20%. Other specifiable options include Lutron Hi-Lume 1% (specify 2-wire, or Ecosystem Dim-to-Off), Lutron 5-Series (5% Ecosystem), DMX (RDM compatible) and DALI protocol drivers. All of our standard 0-10V drivers are NEMA 410 compliant. Lutron and Ecosystem are only available in sizes larger than 18".

MOUNTING OPTIONS

Fortex 3 mounts from a 5" square canopy using four 36" long aircraft cables. Canopy installation determines luminaire alignment.

For cable-mounted fixtures - 5SWAC36 (5" square white canopy and a 36" cable)

[For all other options, see our website for a detailed Pendant Mounting Guide](#)



FINISH

Interior - 95%, reflective matte powder coated white paint

Exterior - matte white or aluminum powder coating. Custom finishes are also available.

CONSTRUCTION

Housing - Extruded Aluminum (0.095" nominal) up to 90% Recycled Content

Interior brackets - Die formed cold rolled sheet steel 18 gauge thick

Reflectors - Cold rolled steel 0.024" thick precisely die formed, 95% reflective matte white painted

Hanger - Chromed Griplock securely attached with spring steel hardware in end caps and/or joiners

Air craft cable suspension - 7x7 braids Aluminum air craft cable 0.06" thick

WEIGHT

Fortex 3 - 18 - 9.22lbs - 4.18kg

Fortex 3 - 33 - 18.26lbs - 8.28kg

Fortex 3 - 44 - 29.11lbs - 13.20kg

Fortex 3 - 14 - 18.67lbs - 8.47kg

Fortex 3 - 34 - 22.63lbs - 10.26kg

OUTWARD/INWARD LIGHT DISTRIBUTION

CERTIFICATIONS

ETL - Rated for Indoor Dry/Damp locations. Conforms to UL Standard 1598 and certified to CAN/CSA Standard C22.2 No. 250.0.

WARRANTY

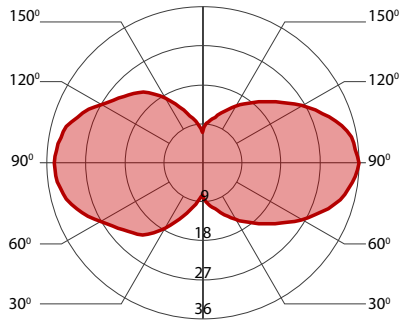
LumenWerx provides a five-year limited warranty of electrical and mechanical performance of the luminaires, including the LED boards, drivers, and auxiliary electronics. LumenWerx will repair or replace defective luminaires or components at our discretion, provided they have been installed and operated in accordance with our specifications. Other limitations apply, please refer to the full warranty on our website.

FORTEX 3 LED

PENDANT

OUTWARD/INWARD LIGHT DISTRIBUTION

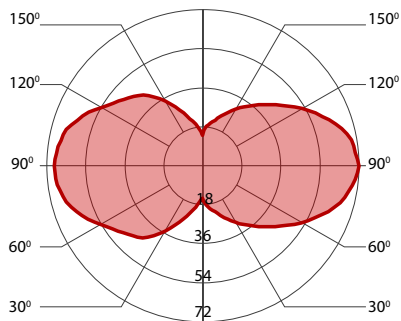
200 LUMEN AT 80CRI - ULTRA LOW OUTPUT



PERFORMANCE PER 1'

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|------------------|------------|-------|--------------------------|--------------|
| ultra low output | 3000K | 2.5 | 200 | 83 |
| ultra low output | 3500K | 2.5 | 200 | 85 |
| ultra low output | 4000K | 2.5 | 200 | 88 |

400 LUMEN AT 80CRI - LOW OUTPUT



PERFORMANCE PER 1'

| LED output | Color Temp | Watts | Nominal Delivered Lumens | Efficacy LPW |
|------------|------------|-------|--------------------------|--------------|
| low output | 3000K | 4.5 | 400 | 91 |
| low output | 3500K | 4.5 | 400 | 94 |
| low output | 4000K | 4 | 400 | 97 |