

Bellevue Convention
Center Authority
Meydenbauer Center
Center Hall Remodel

Bellevue, Washington

PROJECT MANUAL

CONSTRUCTION DOCUMENTS

January 5, 2026



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PART 1 - GENERAL

1.1 PROJECT DESCRIPTION

- A. The Work of the Contract Documents can be summarized as follows:

Interior renovation project for Meydenbauer Center Center Hall ballroom located at 11100 NE 6th Street, Bellevue, WA, 98004. The purpose of the renovation is to upgrade the finishes in our 36,000 square foot ballroom and update the carpeting in the adjoining lobby.

Interior renovations in the following areas:

Level 1- Center Hall Lobby – carpeting

Level 1 – Center Hall – carpeting, paint, wall treatment, lighting upgrades

Schedule:

The work is scheduled to be performed in unoccupied spaces from June 29 through August 28, 2026 (60 days).

Meydenbauer has contracted events starting September 4, 2026. Substantial completion must be completed prior to September 4, 2026. Punch list items can be completed over the next 60 days based on event schedule.

An alternative should be submitted to complete this as early as August 7, 2026 (39 days).

1.2 GENERAL INFORMATION

- A. Title of Contract Documents:

1. Bellevue Convention Center Authority
Project Name: Center Hall Remodel
Project Number: 2026-01

- B. Owner and A/E Defined:

1. Owner:

Bellevue Convention Center Authority
11100 NE 6th St
Bellevue, Washington 98004

Project Manager: Sara Waltemire
E-mail: swaltemire@meydenbauer.com
Phone: 425-450-3743

Owner's Representative: The Owner shall designate, in writing, the Owner's Representative for this Project during construction.

2. A/E: LMN Architects
Address: 801 Second Avenue, Suite 501
Seattle, WA 98104
Representative: Sonja Miranda

E-mail: smiranda@LMNArchitects.com
Phone: 206- 788-3108

2. The Owner, the A/E, and various consultants hereinafter or otherwise listed shall be given access to the Work insofar as their interests are concerned.
- B. A/E's Sub-Consultants: The sub-consultants under contract with the A/E in preparation of the Contract Documents are:
- Electrical: Stantec
Lighting: Horton Lees Brodgen Lighting Design (HLB)
Acoustics: Yantis Acoustics

1.3 SPECIAL CONDITIONS

- A. Description of special conditions of the Work:

1. Definition of work areas by plan set line drawings: Refer to sheet A101.
2. The following is an outline of space availability:

The following areas are available for construction from June 29 through August 28, 2026:

Level 1 – Center Hall Interior
Level 1 – Center Hall Lobby

3. Site Access: Contractor will have access to Meydenbauer Center Loading Dock (3 bays) and parking garage (height restricted for vehicles over 6'9" tall) facility at no charge. One delivery bay must be available for Meydenbauer Center usage.
4. Parking: Contractor and subs have access to a flat lot parking facility adjacent to the Center Hall space and loading dock at no charge for the duration of the project.
5. Equipment and Material Storage: Storage areas will be available on the loading dock and Parking Level 1. There is freight elevator access from the loading dock on Level 1 to Level 4 and Parking Level 1.
6. Walk In Refrigeration Replacement: There is a project scheduled for the replacement of the Walk In Refrigeration units on the facility fourth floor in July 2026. There will be some coordination of material delivery and vehicle access at the loading dock to be coordinated with Owner.

1.4 PROVISION OF CONTRACT DOCUMENTS

- A. After award of the Contract, the Owner will provide to the Contractor, without cost to the Contractor, four (4) sets of the Contract Documents for the Project. All other sets of the Contract Documents required by the Contractor or their Subcontractors for the Project shall be obtained by the Contractor at the Contractor's sole cost.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Include Hazardous Materials or materials needing special handling or disposal, that may be potentially impacted by the project or that could be encountered during construction, have been identified below. The purpose of this section is to identify all of these materials in one section, and refer the reader to subsequent sections as necessary. These materials include asbestos, lead-containing paints, heavy metals containing building components, PCB containing light ballasts, mercury containing fluorescent light tubes, silica-containing construction materials and fugitive dusts.

1.2 RELATED WORK

- A. Work performed under this specification section is governed by related specification sections, including, but not limited to, the following:
 - 1. Division 00: Bidding Requirements, Contract Requirements and Conditions of the Contract;
 - 2. Division 01: General Requirements;

1.3 DEFINITIONS

- A. Hazardous Materials Consultant: a professional who assesses, identifies, and manages risks associated with hazardous substances in a building, site, or transportation context

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The work of this contract includes but is not limited to General Construction, including, Architectural, Demolition, Mechanical, Electrical and Hazardous Materials work at the following Facility:

Meydenbauer Center 11100 N.E. 6th Street

Bellevue, Washington 98004

The Work shall be the providing of all supplies, tools, equipment, transportation, training, utilities, services, permits, superintendence, and labor, and the furnishing of all materials items and accessories needed for the impact, removal and disposal of PCB containing light ballasts, mercury containing fluorescent light tubes, the impact of items coated with lead-containing paint (LCP), various heavy metals containing items and silica-containing building materials in strict conformance with the Contract Documents and all applicable regulations.

- B. Laws, Regulations, Codes and Ordinances: The Contractor shall comply with all applicable laws, regulations, codes, and ordinances concerning the impact, removal, handling, storage, disposal, monitoring and employee protection against exposure or environmental protection against pollution, related to regulated materials requiring special handling or protection during construction.

- C. Supervisory Authority: The Contractor is solely and completely responsible related to the Contractor's supervisory authority over Subcontractors and personnel performing work of this Section.
- D. Submittals: Contractor shall review the scope of work requirements outlined in the Contract Documents and shall submit, and require all Subcontractors performing the work of handling or disposing of any regulated materials to submit, pertinent information required by the Contract Documents.

1.5 ASBESTOS-CONTAINING MATERIALS

- A. The portions of Meydenbauer Center included in the scope of work have been surveyed with the objective of identifying the presence of suspect asbestos-containing materials (ACM). No asbestos-containing building materials were identified as likely to be impacted by the proposed scope of work for this project. Should suspect materials not identified in the "Good Faith" inspection letter attached to this Section be encountered, immediately suspend all work that could disturb said material and notify the Hazardous Materials Consultant who will implement the proper action. Do not proceed with work that could disturb the material until authorized by the Owner, in writing, to do so.
- B. The Contractor shall refer to "Good Faith" inspection letter attached to this Section. The General Contractor shall ensure that a copy of the survey document is retained at the project site, and that additional copies are made available to all Subcontractors.
- C. The Contractor shall be aware that additional suspect-ACM may exist in inaccessible locations of the spaces included in the Work, and in areas of the buildings not included in the Work.
- D. The Contractor shall proceed with caution during all phases of the Work.
- E. Should any suspect-ACM not indicated in the "Good Faith" inspection letter be encountered, the Contractor shall immediately notify the Hazardous Materials Consultant.
- F. The Contractor is advised that, should any ACM, not included in the "Good Faith" inspection letter, be encountered, the Owner may elect to include the abatement of such materials in the Work at a mutually agreed upon price. Work impacting such materials is not to occur prior to the Contractor receiving explicit written authorization from the Owner, and any Work performed without such approval is performed at the Contractor's own risk and expense.

1.6 LEAD-CONTAINING PAINT RELATED ACTIVITIES

- A. Briefly, the lead paint related work can be summarized as follows:
 - 1. Compliance: The Contractor shall comply with all applicable regulations, laws and ordinances concerning the impact, removal, handling, storage, disposal, monitoring and protection against exposure or environmental pollution related to lead. Impacts to lead-containing painted surfaces that may be required by the Work include, but are not limited to: manual demolition, mechanical demolition, cutting, sawing, drilling, welding or torch-cutting. Confirm required impacts with other applicable specification sections and drawings.
 - 2. Handling: Conduct activities involving lead-containing paint under Work of this Contract in accordance with this Section and current applicable state and federal regulations including WAC 296-62, WAC 296-62-07521: "Lead"; WAC 296-155-176: "Occupational Health and Environmental Control"; and 29 CFR 1926.62: "Lead Exposure in Construction - Interim Final Rule".

- B. Work impacting lead-containing painted surfaces within this contract is the responsibility of the Contractor, and all affected Sub-Contractors, and shall be performed in accordance with all applicable local, state and federal regulations.
- C. Based on historical waste characterization data of lead concentrations in the anticipated waste stream, it is anticipated that disposal of the waste stream generated by the Work will not require waste characterization or disposal according to WAC 173-303, Dangerous Waste Regulations.
- D. Contractor shall test representative wastes to determine if materials are regulated under RCRA, 40 CFR Part 261 and WAC 296-155-176. Contractors shall use the Toxicity Characteristic Leaching Procedure (TCLP) to determine if a lead contaminated material is covered under RCRA. If the TCLP determines that the lead concentration is 5 parts per million or greater, the waste is regulated by RCRA and Ecology. The Owner may also take and analyze samples.
- E. Contractor is responsible for the disposal of all dust, debris, disposable protective equipment, cleaning rags, wash water, and any other materials contaminated with dust from activities impacting lead-containing painted coatings such as surface preparation, sanding, scraping, etc not considered hazardous or dangerous waste.

1.7 HEAVY METALS

- A. Based on a review of historical drawings and specifications, the following materials are presumed to contain lead:
 - 1. lead pipes, lead soldering on copper lines;
 - 2. galvanized ductwork;
 - 3. sheet metal and mechanical equipment;
 - 4. lead glazing on all ceramic tile walls, floors and baseboards;
 - 5. lead counterbalances.
- B. The Contractor shall comply with all applicable regulations, laws and ordinances concerning the impact, removal, handling, storage, disposal, monitoring and protection against exposure or environmental pollution related to heavy metals. Impacts to heavy metals that may be required by the Work include, but are not limited to: manual demolition, mechanical demolition, cutting, sawing, drilling, sanding, scraping, welding or torch-cutting. Confirm required impacts with other applicable specification sections and drawings.
- C. Work impacting heavy metal-containing items within this contract is the responsibility of the Contractor, and all affected Sub-Contractors, and shall be performed in accordance with all applicable local, state and federal regulations and the requirements outlined specification Section 02 83 00, Heavy Metals-Related Activities.
- D. Based on paint chip testing data and historical waste characterization data of heavy metals concentrations in the anticipated waste stream, it is anticipated that disposal of the waste stream generated by the Work will not require waste characterization or disposal according to WAC 173-303, Dangerous Waste Regulations.
- E. If specific items are segregated from the waste stream the Contractor shall test each individual waste stream to determine if materials are regulated under RCRA, 40 CFR Part 261 and WAC 296-155-176. Contractors shall use the Toxicity Characteristic Leaching Procedure (TCLP) to determine if a heavy metal contaminated material is covered under RCRA. The Owner may also take and analyze samples.

- F. Contractor is responsible for the disposal of all dust, debris, disposable protective equipment, cleaning rags, wash water, and any other materials contaminated with dust from activities impacting heavy metals-containing items such as surface preparation, sanding, scraping, etc not considered hazardous or dangerous waste.

1.8 POLYCHLORINATED BIPHENYLS (PCBS)

A. Light Ballasts:

1. Representative fluorescent light fixture ballasts were inspected. Light ballasts were labeled as non PCB containing however, select quantities of PCB containing ballasts may be present within the work area. Unmarked ballasts are assumed to contain PCBs. Prevent damage to any unlabeled ballasts and immediately report any leaking ballasts to the Owner's Representative.
2. Contractor shall furnish all labor, training, materials, equipment, services, notices, permits, and insurance (specifically covering the handling, transportation and disposal of PCB-Containing Materials) for activities listed below and in accordance with applicable regulations and the electrical (E series) drawings.
3. Contractor shall perform removal, packaging and disposal of select PCB-containing light ballasts associated with lighting fixtures requiring removal per the electrical (E series) drawings and shall include in the scope of work the investigation of lighting fixtures throughout the entire project area for PCB ballasts.

1.9 MERCURY (HG)

A. Fluorescent Light Tubes:

1. Contractor shall furnish all labor, training, materials, equipment, services and insurance that is specified, shown, or reasonably implied for the removal and handling of all fluorescent light tubes to be disposed and/or recycled as part of the Work. The Washington State Department of Ecology (DOE) recommends that fluorescent light tubes be recycled at an approved recycling facility.
2. Contractor shall perform removal, packaging and disposal/recycling of select mercury-containing fluorescent light tubes associated with lighting fixtures requiring removal per the electrical (E series) drawings and shall include in the scope of work the investigation of lighting fixtures throughout the entire project area for mercury-containing fluorescent light tubes.
3. Work related to mercury-containing fluorescent light tubes within this contract is the responsibility of the Contractor and shall be performed in accordance with all applicable federal, state and local regulations.

1.10 SILICA AND FUGITIVE DUST

- A. All Construction work will potentially generate fugitive dust. It is the responsibility of the Contractor to control the release of all fugitive dust levels and to comply with the latest regulations from the State of Washington Department of Labor and Industries (WISHA), Puget Sound Clean Air Agency (PSCAA) and any other applicable federal, state, and local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
- B. In all cases where potential silica dust exposures may occur, the Contractor shall use any and all feasible engineering and work practice controls to reduce and maintain employee exposure levels to or below the Washington State Permissible Exposure Level. It shall be assumed that

the workers generating the silica dust are exposed above the Permissible Exposure Level until the Contractor air monitoring demonstrates levels below the Permissible Exposure Level.

- C. If visible fugitive dust emissions or respirable crystalline silica dust concentrations exceed 0.05 mg/m³ beyond the perimeter of the work area, the Hazardous Materials Consultant is authorized to stop work. The Contractor shall perform all necessary corrective actions to eliminate visible dust and reduce respirable crystalline silica concentrations to less than 0.05 mg/m³ before resuming work. The Hazardous Materials Consultant may visually monitor for fugitive dust and collect air samples for silica at any time
- D. Construction site work that requires control of silica includes but is not limited activities impacting concrete, brick, mortar, glass, gypsum wallboard, asphalt filler, plaster, ceramic tile, roofing granules, caulking (clay), fireproofing, and construction dust building materials associated with this project.
- E. Work activities shall include the following, as applicable:
 - 1. Provision of site security to assure that no member of the public is able to gain access to the construction work area at any time. The Contractor shall maintain access and egress routes at all times.
 - 2. In the case of concrete and demolition work, the Contractor shall provide worker training, respiratory protection, and medical examinations, as necessary, to meet applicable silica regulations and regulatory guidance regarding silica exposures.
 - 3. Provision of good work practices to prevent the release of fugitive and silica dust outside of the work area.
 - 4. Provisions for worker and equipment decontamination. Worker decontamination and equipment areas shall be cleaned daily or as required more frequently to prevent dust emissions.
 - 5. Protection of security, life safety, and energy management systems, including associated wiring, which shall remain operational throughout the work activities.s:

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION 011101

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Sections:
- C. 012600 – Contract Modification Procedures for procedures for submitting & handling Change Orders.
- D. 014000 – Quality Requirements for general testing and inspecting requirements

1.2 DEFINITIONS

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

1.3 UNIT PRICE REQUIREMENTS

- A. General:
 - 1. Perform Work required by unit prices in accordance with Contract Documents.
 - 2. Unit prices cover portions of Work added to or deducted from quantities indicated by Contract Documents.
 - 3. Unit prices are for work in place, except where indicated otherwise.
 - 4. Acceptance or rejection of unit prices, partially or completely, will be declared at time of Contract award
- A. Unit Prices for Additions or Deletions Include:
 - 1. Materials.
 - 2. Delivery to site.
 - 3. Supervision and labor.
 - 4. Installation, including associated accessories.
 - 5. Insurance.
 - 6. Applicable taxes.
 - 7. Overhead and profit.
 - 8. Handling, including receiving, unloading, uncrating, storage, and distribution.
 - 9. Protection from damage and from elements.
 - 10. Submittal and processing of product data, shop drawings, samples, and other required submittals
 - 11. Other expenses required to complete installation.

1.4 SCHEDULE OF UNIT PRICES:

- A. Individual Unit Prices are as follows:
 - 1. Carpet Tile
 - 2. Acoustical Stretched Fabric Wrapped Panels

END OF SECTION 012200

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

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

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Change Order for GMP, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other Work of the Contract.
- D. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Existing Wall-Mounted Devices
 - 1. Base Bid: Reinstall existing flush and recessed wall-mount devices (A/V, electrical, fire alarm devices, etc.) and access doors occur where occurring in new wall panels. Re-set

- devices and access doors to be plumb and parallel to adjacent. Ensure new wall panels are cut precisely to tightly abut recessed devices.
2. Alternate: Provide new access doors in new wall panels over existing devices. Provide single doors over groups of adjacent devices or one per each at large and/or isolated devices as indicated in drawings.
- B. Alternate No. 2: Fire Extinguisher Cabinets
1. Base Bid: Relocate existing fire extinguisher cabinets per drawings.
 2. Alternate 2a: Provide new field-painted, solid-door, fire extinguisher cabinets throughout exhibit hall. Existing hand-carried fire extinguishers to be reinstalled in new cabinets. Hose cabinets to remain.
 3. Alternate 2b: Identical to 2a plus replace hose cabinets.
- C. Alternate No. 3: Acoustic Stretched Fabric Wall System (ASFW)
1. Base Bid: Install new fabric over existing track and core to remain. Provide additional scrim layer to obscure frame and core.
 2. Alternate: remove all existing fabric, track and core. Provide new fabric, track and core at all areas of ASFW.
- D. Alternate No. 4: Schedule
1. Base Bid: Substantial Completion within 60 days of NTP
 2. Alternate No. 4a: Substantial Completion within 53 days of NTP
 3. Alternate No. 4b: Substantial Completion within 46 days of NTP
 4. Alternate No. 4c: Substantial Completion within 39 days of NTP

END OF SECTION 012300

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative procedures for handling requests for substitutions made before and after award of Contract.
- B. Related Sections:
 - 1. 012300 – Alternates: for products selected under an alternate
 - 2. 016000 – Product Requirements: Product options which authorize a substitution request form.
- C. Attachments following this section:
 - 1. Substitution Request Form

1.2 PRODUCT SUBSTITUTIONS

- A. General: If the proposer or Contractor desires approval of some material or product other than that specified, submit a written request for approval of the substitute item in accordance with the following requirements:
 - 1. Requests for approval of equals or substitutions must be made in writing and received by the Architect at least ten (10) working days prior to scheduled time for receipt of bids. Requests for substitution will not be considered after Notice to Proceed, except under one or more of the conditions stated in paragraph 1.3, below.
 - 2. All such requests must be made on the Substitution Request Form; see attached at end of this Section.
 - 3. Any approval of the proposed equals or substitutions will be made by Addendum prior to receipt of bids, and by duly executed Change Order after receipt of bids. Proposers shall not rely upon any approval not incorporated into the Contract Documents in this matter.
 - 4. Requests received after this time will not be reviewed or considered. No request for approval will be considered unless submitted in accordance with this Section.
 - 5. Final decision as to whether an item is an equal or satisfactory substitution rests with the Architect.
 - 6. Clearly mark manufacturer's literature to indicate equality in performance and appearance.
- B. Substitution Requests: Every substitution request must state whether the item offered is an equal or equivalent to the specified product. The substitute material or product must be accompanied by its reference in the Contract Documents and complete catalog, technical and other information, as appropriate. In addition to requirements indicated on the Substitution Request Form, comply with following:
 - 1. As required, include samples showing comparison of physical and other pertinent characteristics as required to establish equivalence of acceptability for the proposed application. This will require also providing data of the material or product specified to provide a side-by-side comparison.
 - 2. Where specific test results are required by the Contract Documents, the comparison data for the proposed item shall be based upon the same test methods as those specified, or they shall be correlated to clearly demonstrate comparability.
 - 3. The same guarantee/warranty described for the specified product is required for the substitution.
 - 4. Coordination information, including a list of changes or modifications needed to other parts of the Work that will become necessary to accommodate the proposed substitution.
 - 5. Cost information, including net change, if any.

6. Contractor shall accompany any request for substitution with such drawings, specifications, samples, manufacturer's literature, performance data, and other information necessary to describe and evaluate the proposed substitution completely. The burden of proof shall be on the Contractor.
 7. As required, provide references of three (3) similar projects where proposed substitute product has been used successfully, on a separate sheet, include names, addresses, date of installation and contact name of Owner or facilities manager.
- C. Coordination And Redesign: In making request for approval of substitute materials, the Contractor must represent that it has investigated the proposed product and, in its opinion, it is equal or equivalent in all respects to that specified. Also, Contractor will coordinate all trades including changes thereto as may be required, that it waives all claims for additional costs or time extension for Completion which subsequently become apparent as a consequence of the substitution and that it will bear all costs related hereto, including costs of Architect's services for redesign if deemed necessary.
1. If any substitution will affect a correlated function, adjacent construction, or the work of other trades or contractors, the necessary changes and modifications to the affected work shall be considered as an essential part of the proposed substitution, to be accomplished by the Contractor without additional expense to the Owner if and when accepted.
- D. Substitutions will not be considered if they are indicated or implied on Shop Drawings or other project data submittals, without proper notice shown on attached form.

1.3 SUBSTITUTIONS AFTER TIMES STATED ABOVE

- A. Request for Approval: Substitution requests for approval of substitute materials will not be considered after the time period stated above, except if one or more of the following conditions exists. With its request, the Contractor shall indicate which condition it believes applies.
1. Unavailability: A substitution is required because the specified item is not available, due to factors beyond the control of the Contractor or Subcontractor. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the work promptly or coordinate activities properly.
 2. Unsuitability: Subsequent information or changes disclose inability of the specified item to perform as intended, and where the Contractor certifies that the proposed substitution will overcome such non-performance.
 3. Regulatory Requirements: Final interpretation of Code, regulatory requirements, safety requirements, or insurance requirements necessitate a change due to inability of the specified item to conform, and the proposed substitution can be approved.
 4. Warranty: Manufacturer or fabricator cannot certify or warrant performance of specified item as required, and where the Contractor certifies that the proposed substitution will provide the required warranty.
 5. Owner's Benefit: Acceptance of the proposed substitution is clearly in the Owner's best interest because of cost, quality, or other consideration. In requesting a substitution under this clause, the Contractor shall furnish substantiation of any such reason.

1.4 ARCHITECT'S REVIEW

- A. Architect will review requests for proposed substitutions on Substitution Request Form with reasonable promptness.
- B. Considerations for acceptance will be based on conformance with Contract Documents, including following as applicable:
1. Physical dimension and clearance requirements to satisfy space limitations.
 2. Static and dynamic weight limitations; structural properties.

3. Audible noise levels.
4. Vibration generation.
5. Interchangeability of parts or components.
6. Accessibility for maintenance to allow possible removal or replacement.
7. Design aesthetics.
8. Colors, textures, and finishes.
9. Compatibility with other materials, products, assemblies, and components.

C. Architect's decision to accept or reject requested substitution will be final

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

Substitution Request Form

SR #	Date

SECTION **PARAGRAPH** **SPECIFIED ITEM**

Proposed Substitution: _____

Reason for Substitution: _____

REQUIREMENTS FOR REQUEST TO BE CONSIDERED – To support the substitution, provide product data, dimensional data, photographs, samples, performance and test data, and project references as necessary to evaluate the substitution request. In addition, a side-by-side matrix must be included of the specified criteria comparing it to the proposed substitution.

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The function, appearance & quality of the proposed substitution are equivalent or superior to the specified item.
2. The proposed substitution does not affect dimensions shown on Drawings.
3. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
4. The proposed substitution will have no adverse effect to: other trades, cost to Owner, the construction schedule, or specified warranty requirements, and is acceptable to the jurisdiction having authority.
5. Maintenance and service parts will be locally available for the proposed substitution.
6. This submittal includes all the necessary substantiating data to provide equal quality, performance, and appearance to that specified, including reference for three projects where substitution has been successfully installed per section 012500 – Product Substitution Procedures.
7. Certify substitution meets Sustainability criteria identified in Division 01.

Submitted by Contractor:

Signature

Name

Firm

Address

City, State, Zip

Date

Phone, Email

Action by the A/E:

☐ **ACCEPTED** ☐ **ACCEPTED AS NOTED**

☐ **NOT ACCEPTED**

By

Date

Remarks:

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Includes: Administrative and procedural requirements for handling and processing Contract modifications and changes in the Project. The requirements of this Section are in addition to those stated in the "General Conditions". In general, this Section includes the following:
 - 1. Architect's Supplemental Instructions (ASI).
 - 2. Proposal Request (PR)
 - 3. Change Order Request (COR).
 - 4. Change Order (CO).
 - 5. Construction Change Directive (CCD).
- B. Related Sections:
 - 1. 012500 - Product Substitution Procedures.
 - 2. 012900 - Payment Procedures.
 - 3. 013300 - Submittal Procedures.
 - 4. 016000 - Product Requirements.
 - 5. 017700 - Closeout Procedures.

1.2 SUBMITTALS

- A. General:
 - 1. Submit names of individuals authorized to receive Contract modification documents.
 - 2. Submit names of individuals responsible for informing Contractor's employees and affected subcontractors of Contract clarifications and modifications.

1.3 CHANGE PROCEDURES

- A. General: Change procedures are written instructions issued after execution of Contract Agreement.
- B. Minor Changes in the Work:
- C. Form: Architect's Supplemental Instructions (ASI), attached.
 - 1. Description: Written instructions, clarifications, or interpretations of Contract Documents not involving adjustment to Contract Sum or Contract Time. Instructions or interpretations are binding on Owner and Contractor.
 - 2. Procedure: Document is prepared and signed by Architect and distributed to Owner and Contractor. Architect's Supplemental Instructions are effective upon receipt.
- D. Proposal Request (PR):
 - 1. Form: AIA Document G709-2018, *Proposal Request*

2. Description: Written proposed change of Work within Contract scope consisting of additions, deletions, and other revisions. Proposal Request is for information only and does not authorize changes in Contract Sum or Contract Time. Contractor evaluates proposal for pricing and scheduling impact.
 3. Procedure:
 - a. Document is prepared and signed by Architect. Copies are sent to Owner and Contractor.
 - b. Contractor shall review Proposal Request and submit Change Order Request and Proposal Worksheet Detail and Summary Forms with proposed changes in Contract Sum and Contract Time.
 - c. Prepare and submit Change Order Request and Proposal Worksheet Detail and Summary Forms Architect within 20 days of Proposal Request receipt. Proposed Contract Sum and Contract Time changes quoted by Contractor shall remain valid for 30 days from receipt by Architect.
- E. Change Order Request (COR):
1. Attached Forms:
 - a. Change Order Request: Describes and summarizes Contractor's proposed changes. Indicates changes in Contract Sum and Contract Time.
 - b. Proposal Worksheet Summary: Summarizes labor, materials, overhead and profit, bonds, insurance, and tax of proposed Contract additions and deductions.
 - c. Proposal Worksheet Detail: Summarizes labor and material costs of each subcontractor involved in proposed change.
 2. Description: Written proposed change of Work consisting of additions, deletions, and other revisions. Submit Change Order Request to Architect for conditions which require Contract Document modifications. Include proposed changes in Contract Sum and Contract Time.
 3. Procedure:
 - a. Proposed changes are documented by Contractor on Change Order Request, Proposal Worksheet Summary, and Proposal Worksheet Detail forms. Documents include description of proposed changes and summary of changes in Contract Sum and Contract Time are prepared and signed by Contractor. Send copies to Owner and Architect.
 - b. Comply with requirements of Section 012500 - Product Substitution Procedures for proposed changes in Work which include products or systems not contained in Contract Documents.
 - c. Architect and Owner will review Change Order Request and evaluate proposed changes. Architect and Owner may accept or reject Change Order Request. Upon acceptance Architect will prepare Change Order to document Contract change.
- F. Change Order (CO):
1. Form: Change Order, AIA Document G701-2017
 2. Description: Written change of Work within Contract scope consisting of additions, deletions, and other revisions, including proposed basis for adjustment to Contract Sum and Contract Time. Change Orders are signed

by Owner, Contractor, and Architect. Owner's signature authorizes change.

3. Procedure: Document is prepared and signed by Architect; sent to Contractor for acceptance and signature; approved and signed by Owner; distributed to Architect and Contractor. Contractor shall perform changes upon receipt.

G. Construction Change Directive (CCD):

1. Form: Construction Change Directive, AIA Document G714-2017
2. Description: Written change of Work within Contract scope consisting of additions, deletions, and other revisions, including a proposed basis for adjustment to Contract Sum and Contract Time. Document is used in absence of agreement on terms of Change Orders.
3. Procedure:
 - a. Document is prepared and signed by Architect and Owner. Contractor shall perform changes upon receipt.
 - b. Adjustments to Contract Sum should be one of following:
 - 1) Lump sum.
 - 2) Unit price.
 - 3) Mutually accepted method.
 - 4) As provided in AIA Document A201 Subparagraph 7.3.6; maintain detailed records on time and material basis of Construction Change Directive Work.
 - c. Architect will determine proposed method, time, and amount of Contract adjustment based on reasonable expenditures, and allowance for overhead, profit, and time.
 - d. Contractor's signing of Construction Change Directive acknowledges agreement with proposed method for adjusting Contract Sum and Contract Time and is recorded as Change Order.
 - e. Contractor disagreement or no response to proposed method for adjusting Contract Sum or Contract Time does not relieve Contractor from responsibility to perform Work.
 - f. Payment for Construction Change Directives will be made in accordance with AIA Document A201 Subparagraph 9.3.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION 012600

Architect's Supplemental Instructions

Project

No.

Location

0000

Date

Month-date-year

To Owner:

To Contractor:

From Architect: LMN Architects

☐ Architectural ☐ Civil ☐ Landscape ☐ Structural ☐ Mechanical ☐ Electrical ☐ Plumbing ☐ Other

These instructions are issued for the purpose of clarifying the Contract Documents, based on an interpretation reasonably inferable from the Contract Documents, and therefore have no effect on the Contract Sum and/or Contract Time.

Commencement of the work described in these instructions indicates Contractor's acceptance with no change in the Contract Sum and/or Contract Time. Contractor must submit written notification to the Owner within seven (7) calendar days of receipt of these instructions if the clarification causes any change to the Contract Sum and/or Contract time.

Description:

Comments:

Attachments:

Issued By:

Architect's Representative

Date

Owner's Representative

Date

CHANGE ORDER REQUEST (PROPOSAL)

Project: **Meydenbauer Center**
Center Hall Remodel

COR Number: _____

From (Contractor): _____

To: _____

Date: _____

A/E Project Number: _____

RE: _____

Contract For: _____

This Change Order Request (COR) contains an itemized quotation for changes in the Contract Sum and/or Time in response to proposed modifications to the Contract Documents base on Proposal Request Number

Description of Proposed Change:

☐ Attachment

Reason For Change:

Does Proposed Change involve a change in Contract Sum or Contract Time? ☐ Yes ☐ No

If Yes: Proposed Change in Contract Sum _____

Proposed Change in Contract Time _____

Attached Pages: Proposed Worksheet Summary
Proposed Worksheet Detail(s)

Signed by: _____

☐ Attached is supporting information from ☐ Subcontractor ☐ Supplier ☐ _____ ☐ _____

Copies: ☐ Owner ☐ Contractor ☐ Consultants ☐ Field ☐ _____ ☐ _____

PROPOSAL WORKSHEET SUMMARY

Project: **Meydenbauer Center**
Center Hall Remodel

COR Number: _____

_____ From (Contractor): _____

To: _____ Date: _____

Proposal Request Number: _____ A/E Project Number: _____

Complete and attach Proposal Worksheet Detail for each Subcontractor. Enter Work Sheet Information below.

SUBCONTRACTORS' ADDITIONS:

Sheet	Description	Material	Labor	Sub-Total
1				
2				
3				
4				
5				
6				
7				
Sub-Total				

SUBCONTRACTORS' DEDUCTS:

Sheet	Description	Material	Labor	Sub-Total
1				
2				
3				
4				
5				
6				
7				
Sub-Total				

Subcontractors' Net: _____
Subcontractors' OH&P: _____
Subcontractors' Bond: _____
Subcontractors' Total: _____
General Contractor OH&P: _____
General Contractor Bond: _____
Insurance: _____
Tax: _____
WORKSHEET TOTAL: _____

PROPOSAL WORKSHEET DETAIL

Project Name: _____

COR Number: _____

Project Number: _____

Detail Sheet Number: _____

Subcontractor Name: _____

Date: _____

Phone Number/Contact Person: _____

DO NOT MARK IN SHADED AREAS.**ADDITIONS**

					UNIT PRICES				SUB-TOTALS					
	Ref. No.	Item Description	Quantity		Materials		Labor		Materials		Labor		TOTAL	
1														
2														
3														
4														
5														
Sub-Total (Enter this number on Work Sheet Summary.)														

DEDUCTIONS

					UNIT PRICES				SUB-TOTALS					
	Ref. No.	Item Description	Quantity		Materials		Labor		Materials		Labor		TOTAL	
1														
2														
3														
4														
5														
Sub-Total (Enter this number on Work Sheet Summary.)														

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the administrative and procedural requirements for Contractor progress payment and release of retainage as herein specified and further described in Part 6 of the General Conditions.
- B. Owner's forms referenced in this Section include (see Appendix A):
 - 1. Application and Certificate for Payment on Contract (Application for Payment)
 - 2. Construction Invoice Voucher
 - 3. Retainage Invoice Voucher
 - 4. Monthly Subcontractors List and Certifications
 - 5. Certificate of Payment of Labor and Materials
 - 6. Apprentice and Journey Level Worker Utilization Report

1.2 PREREQUISITES FOR FIRST APPLICATION FOR PAYMENT

- A. Progress Schedule: Submit and receive approval of the "preliminary" Progress Schedule.
- B. Prevailing Wage Forms: Submit Statement of Intent to Pay Prevailing Wages form, approved by the Department of Labor and Industries, prior to commencing the Work (see Part 5.04B of the General Conditions). The Owner will not make payment on an Application for Payment until the Contractor has filed with the Owner an approved copy of the form for the Contractor and every Subcontractor of every tier that performed work during the payment period and are included in an Application for Payment. The form shall list every classification of laborer, worker, or mechanic employed by the Contractor and its Subcontractors. THERE ARE NO EXCEPTIONS TO THIS REQUIREMENT.
 - 1. The website address link to the prevailing wage forms is included in Appendix A.
 - 2. The website address link to the "Washington State Prevailing Wage Rates for Public Works Contracts" is included in Appendix B.
- C. Schedule of Values: Before submitting the first Application for Payment, submit and receive approval of the Schedule of Values allocating the detail of the Contract Award Amount, in a breakdown acceptable to the Owner, which shall be documented on the Application for Payment (see 1.5A8 "Building Componentization Report" in this Section for additional Final Completion construction cost reporting requirements). The approved Schedule of Values will be used by the Owner as the basis for progress payments. PAYMENT

FOR WORK WILL ONLY BE MADE FOR, AND IN ACCORDANCE WITH, THOSE ITEMS INCLUDED IN THE APPROVED SCHEDULE OF VALUES.

1. Format: On 8-1/2" x 11" paper
 2. Content: Include as a minimum the following:
 - a. Individual Items of Work.
 - (1) Major cost items, which are not directly a cost of actual work-in-place, shall be shown as separate items in the Schedule of Values, and shall include the following items: General Conditions, mobilization, and distinct temporary facilities shall not exceed 3% of the Contract Award Amount.
 - (2) Section 017700 "Closeout Procedures" shall not be less than 4% of the Contract Award Amount.
 - (3) Preparation and submittal to Owner of Construction Baseline Schedule and Submittal Schedule shall not be less than 1/4% of the Contract Award Amount.
 - (4) Preparation of monthly Progress Schedule updates shall not be less than 1/4% of the Contract Award Amount, with the value of each update apportioned equally.
 - b. For items on which progress payments will be requested for materials or equipment purchased/fabricated/delivered, but not yet installed, show "initial value" for payment request and "value added" for subsequent stage(s) of completion on that unit of work.
 - c. For each line item of installed value exceeding 10% of Contract Award Amount, show breakdown by major products or operations under each item.
 - d. Breakdown major work efforts by floor or phases or systems as appropriate for ease of review and confirmation of Work completed.
 - e. Breakdown mechanical and electrical systems or phases with material and labor as separate items.
 3. Round figures to nearest dollar amount.
 4. Make sum of total scheduled costs equal to the Contract Award Amount. Do not include State of Washington sales tax.
 5. Coordinate items of the Schedule of Values so that there is a corresponding item in the Progress Schedule.
 6. Revise as requested by Owner.
- D. Subcontractors List: Submit a list of all Subcontractors and major material suppliers consistent with Part 5.20B of the General Conditions.

- E. Retainage: Submit instructions for the disposition of retainage funds.
1. In accordance with Part 6.04B of the General Conditions and Chapter 60.28 RCW, the Owner shall reserve a Contract retainage in an amount not-to-exceed 5% of the moneys earned by the Contractor as a trust fund for the protection and payment of:
 - a. The claims of any person arising under the Contract Documents;
 - b. The State of Washington with respect to taxes imposed pursuant to Titles 50, 51, and 82 RCW which may be due from the Contractor, and;
 - c. The Owner for claims it may have against the Contractor.
 2. Contractor's written instructions should be addressed to the Bellevue Convention Center Authority, 11100 NE 6th Street, Bellevue, Washington 98004.
 3. At the option of the Contractor, the moneys reserved by the Owner shall be:
 - a. Retained in a fund by the Owner; or
 - b. Bonded by the Contractor (if approved by Owner) for all of the Contract retainage in a form acceptable to the Owner; or
 - c. Deposited by the Owner in an Owner's interest bearing account in a bank, mutual savings bank, or savings and loan association; or
 - d. Placed in escrow with a bank or trust company by the Owner.
 - (1) Escrow Agent: If the retained funds are to be placed in escrow, Contractor will select the escrow agent, subject to approval by the Owner. The selected agent must be a bank or trust company in the State of Washington.
 - (2) Escrow Agreement: Pursuant to electing the escrow option, an escrow agreement shall be executed by Contractor, Owner, and bank. A completed and signed escrow agreement in a form acceptable to the Owner must be on file with the Owner for payment before the Contractor's first Application for Payment is processed.
 - (3) Escrow Payments: As each progress estimate is presented for payment, Contractor shall make a voucher request for the retained funds that are to be placed in escrow. Such requests should be prepared on the Owner's Retainage Invoice Voucher form and submitted in four (4) copies with the related Application for Payment. Upon receiving a retainage invoice, the Owner will issue a check payable to the Contractor and the bank jointly. Such checks will be

mailed to the bank and the Contractor will receive copies of check transmittal letters.

- (4) Escrow Investments: The bank shall invest the retained funds in bonds and other securities selected by the Contractor from the following list approved by the Owner:
- (a) Bills, certificates, notes or bonds of the United States;
 - (b) Other obligations of the United States or its agencies;
 - (c) Obligations of any corporation wholly owned by the government of the United States;
 - (d) Indebtedness of the Federal National Mortgage Association;
 - (e) Time deposits in commercial banks, mutual savings banks, and savings and loan associations in the State of Washington;
 - (f) Deposits in savings accounts in commercial banks, mutual savings banks, and savings and loan associations in the State of Washington.
- (5) The investments selected must mature on or prior to the date set for Substantial Completion, including extensions thereof or no later than forty five (45) days following the Final Acceptance of the Work. Interest on such investments shall be paid to the Contractor by the escrow agent as it accrues.
- (6) Escrow Costs and Fees: All escrow costs and fees shall be paid by the Contractor, in accordance with the escrow agreement.

1.3 DRAFT APPLICATION FOR PAYMENT

- A. Submit a draft Application for Payment for Owner's review and comment. The cutoff date shall be five (5) days prior to actual application or as otherwise agreed. Include projected costs to the end of the month in the pay request. Provide the following documents (draft documents may be marked by hand):
1. Application and Certificate for Payment on Contract form: Fill in required information.
 - a. Mechanical and electrical Subcontractor's draft monthly payment requests shall be submitted, for review and comment, prior to the A/E's and Owner's review of the Contractor's draft monthly Application for Payment.
 - b. List Change Orders approved prior to the submission date individually (last on the form). Use Owner's Change Order designation and

description (similar to an original component item of work). DO NOT BILL FOR CHANGE ORDER PROPOSALS UNTIL AN APPROVED CHANGE ORDER HAS BEEN RECEIVED FROM THE OWNER INCORPORATING THE PROPOSAL.

2. Monthly Subcontractors List and Certifications form.
 3. Stored Materials: The Contractor is solely responsible for the stored materials. Requests for payment on materials stored shall be for materials properly stored on the Project site. In addition to the requirements of the General Conditions, payment for materials stored off-site shall be at the sole option of the Owner and comply with conditions stipulated by the Owner. These conditions may include, but are not limited to:
 - a. Provide supplier invoice
 - b. Provide insurance or a bond to cover the total loss of material and time impact to Project
 4. Monthly Progress Schedule updates with change in Contract Time analysis.
 5. Apprentice and Journey Level Worker Utilization Report.
- B. The A/E and/or Owner and the Contractor shall review the Project Record for completeness and accuracy.

1.4 APPLICATION FOR PAYMENT

- A. The Contractor shall submit two (2) hardcopies of the Application for Payment to the Owner after responding to the Owner's comments to the draft application.
- B. The Contractor is cautioned to carefully check all extensions, totals, and required information for accuracy before submittal.
- C. Applications are to be signed by a responsible officer of the Contractor. Do not sign in black ink. (NO PHOTOCOPIES OF SIGNATURE ARE PERMITTED)
- D. The Application for Payment shall include the following Owner forms and documents:
 1. Application and Certificate for Payment on Contract
 2. Construction Invoice Voucher (for the total amount due)
 3. Retainage Invoice Voucher (for the retainage amount)
 4. Monthly Subcontractors List and Certifications
 5. Invoices for materials stored off-site
 6. Apprentice and Journey Level Worker Utilization Report

- E. Do not include certified payrolls unless requested by the Owner or required elsewhere.
- F. When the Owner and A/E find the Application for Payment properly completed and correct, they will sign and transmit all copies of the Application for Payment to the Capital Projects accounting office for processing.
- G. If the A/E or Owner find the Application for Payment improperly or incorrectly executed, an annotated copy will be returned for a new submittal.
- H. Only minor corrections are allowed on the original, with approval of Owner.

1.5 PRIOR TO FINAL APPLICATION FOR PAYMENT

- A. The final Application for Payment request will be accepted for processing only after providing satisfactory completion of the following:
 - 1. Application and Certificate for Payment on Contract
 - 2. Construction Invoice Voucher (for the total amount due)
 - 3. Retainage Invoice Voucher (for the retainage amount)
 - 4. Monthly Subcontractors List and Certifications
 - 5. Invoices for materials stored off-site
 - 6. Final Completion procedures per Section 01 77 00 "Closeout Procedures"
 - 7. Final Schedule of Values "Contract Sum"
 - 8. Building Componentization Report" allocating the final Contract Sum to each of the following categories:
 - a. Interior construction
 - b. Floor covering
 - c. Lighting and electrical
 - 9. Apprentice and Journey Level Worker Utilization Report

1.6 RELEASE OF RETAINAGE

- A. Pursuant to the completion of Work performed in accordance with the Public Works Contract and Final Acceptance by the Owner, the following requirements must be satisfied prior to the release of retained Contract funds.
 - 1. "Notice of Completion of Public Works Contract (REV 31 0020)": This Department of Revenue form will be completed by the Owner, establishing the date of Final Acceptance thereon. Three copies of the notice will be mailed to the Department of Revenue and a copy will be transmitted to Contractor.
 - 2. "Certificate of Payment of State Excise Taxes by Public Works Contractor (REV 31 0028)": Following receipt of the Owner's Notice of Completion of Public Works Contract form and after determining that all taxes,

interest and penalties due from Contractor have been paid, the Department of Revenue will issue this certificate to Owner, thereby notifying the Owner that it has no objection to the release of retainage to the Contractor.

3. "Certificate of Payment of Contributions, Penalties and Interest on Public Work Contract (EMS 8449 760)": Upon receiving a copy of the Owner's Notice of Completion of Public Works Contract form from the Department of Revenue and determining that the Contractor is in compliance with the provisions of the Employment Security Act, the Employment Security Department will issue this certificate to Owner, thereby notifying the Owner that it has no objection to the release of retainage to the Contractor.
 4. Upon receiving a copy of the Owner's Notice of Completion of Public Works Contract form and determining that the Contractor is in compliance with the provisions of Chapter 51 RCW for payment of industrial insurance premiums, the Department of Labor and Industries will issue a certificate for the Owner, thereby notifying the Owner that it has no objection to the release of retainage to the Contractor.
 5. "Affidavit of Wages Paid on Public Works Contract" (F700-007-000): An Affidavit of Wages Paid, for the Contractor, each Subcontractor, and each sub-tier Subcontractor, approved by the Industrial Statistician of the Department of Labor and Industries, must be submitted by the Contractor to the Owner. Contractors and Subcontractors may file the Affidavit of Wages Paid either on-line at the website link provided in Appendix A or by completing the forms manually.
 6. "Certificate of Payment of Labor and Materials": This Owner's form shall be completed by the Contractor and returned to the Owner. If the only exception to full payment to all Subcontractors is retainage owed to Subcontractors, the appropriate box on the form should be checked.
 7. Invoice Voucher: If the retained funds are on deposit in Owner accounts, the Contractor shall prepare a Retainage Invoice Voucher for the total amount retained and submit to the Owner for payment. If these funds have been placed in escrow at the direction of Contractor, no further invoice is required.
- B. Retainage will be paid by the Owner to the Contractor sixty (60) days following the published date of Final Acceptance, contingent upon the Contractor's compliance with provisions of public works statutes and as stated above. If there are either unpaid taxes or unsatisfied claims of lien against the retained percentage, disbursement of retainage funds will be made in accordance with State of Washington law.
- C. Address all transmittal of retainage documents to the Owner's Contracts Office at: Bellevue Convention Center Authority, 11100 NE 6th Street, Bellevue, Washington, 98004.

3 PART 2 - PRODUCTS (Not Used)

4 PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Bidder-design systems.
 - 5. Project meetings.
- B. Related Requirements:
 - 1. 013200 - Construction Progress Documentation: for preparing and submitting Contractor's construction schedule.
 - 2. 017300 – Execution Requirements: for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. 017700 - Closeout Procedures: for coordinating closeout of the Contract.

1.2 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work, and that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.

5. Progress meetings.
 6. Pre-installation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.
- E. Coordinate Bidder-Design System: Where indicated in the technical sections, provide design, engineering and fabrication for the complete installation of building system or assembly included in the Bidder's Cost of the Work. Include all accommodations for complete installation of system, including coordination with each trade forming a component part of the system or assembly as required to meet the design and performance criteria, and as required to maintain the integrity of the building design aesthetic. Architect will be the judge for acceptance of Bidder-Design systems.

1.3 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Review: Architect will review coordination drawings and digital files to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
 - a. Coordination Drawings may be incorporated into the BIM process such that the effort exists solely within a digital model so long as the following criteria are met:
 - 1) The Architect's review can still be accomplished.
 - 2) Coordination efforts can be effectively communicated in the field.
 - 3) The digital files will be turned over to the Owner.
 2. BIM File Incorporation: Develop and incorporate coordination files into BIM as governed the BIM Execution Plan (BEP). Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts prior to submittal. Indicate where conflict resolution requires modification of design requirements by Architect.
 - a. Architect will furnish Contractor one set of digital data files of Drawings for use in preparing coordination digital data files.
 - 1) Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - 2) Contractor shall execute a data licensing agreement in the

form of Agreement included in this Project Manual; see section 013301.

1.3 REQUESTS FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in a form that has been prior approved by the Owner and Architect.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor, and subcontractor
 - 5. Name of Architect.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractor's signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Form bound in Project Manual or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
 - 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. Pacific Time, will be considered as received the following working day.
 - 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.

- b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Proposed Change (PC) according to Section 012600 - Contract Modification Procedures.
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Owner in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly on a form that is acceptable to the Owner and Architect.
 1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect and Owner.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's and Owner's response was received.
- F. On receipt of Architect's and Owner's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Owner within seven days if Contractor disagrees with response.
 1. Identification of related Minor Change in the Work, Construction Change Directive (CCD), and Proposed Change (PC), as appropriate.

1.4 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model and CAD drawings will be provided by Architect for Contractor's use during construction.

3. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project Record Drawings.
4. Digital Modeling Software: Building information Models are available as stipulated in the BIM Execution Plan (BEP). Follow all requirements of the BIM Execution Plan.
5. Contractor shall execute a data licensing agreement in the form of AIA

Document C106 Digital Data Licensing Agreement.

- a. Subcontractors and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of AIA Document C106.
 6. At completion of Project, provide digital archive in format that is readable format required in the BIM Execution Plan (BEP). common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
- B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
 1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links and bookmarks enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
- C. Web-Based Project Management Software Package: Provide, administer, and use web-based Project management software package for purposes of hosting and managing Project communication and documentation until Final Completion.
 1. Web-based Project management software includes, at a minimum, the following features:
 - a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
 - b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
 - c. Document workflow planning, allowing customization of workflow between project entities.
 - d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
 - e. Track status of each Project communication in real time, and log time and date when responses are provided.
 - f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
 - g. Processing and tracking of payment applications.
 - h. Processing and tracking of contract modifications.
 - i. Creating and distributing meeting minutes.
 - j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
 - k. Management of construction progress photographs.
 - l. Mobile device compatibility, including smartphones and tablets.
 - m. **<Insert description of software feature>.**
 2. Provide up to [seven] **<Insert number>** Project management software user licenses for use of Owner[, **Owner's Commissioning Authority**] [, **Construction Manager**], Architect, and Architect's consultants. Provide [eight] **<Insert number>** hours of software training at Architect's office for web-based Project software users.

3. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.

B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.2 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of seven days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of web-based Project software.
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - k. Procedures for processing Applications for Payment.
 - l. Distribution of the Contract Documents.
 - m. Submittal procedures.
 - n. Sustainable design requirements.
 - 1) General requirements for sustainable design-related procurement and documentation.
 - 2) Construction waste management plan.
 - 3) Indoor air quality (IAQ) management plan and procedures
 - 4) Construction operations and sustainable design requirements and restrictions.
 - o. Preparation of Record Documents.

- p. Use of the premises
 - q. Work restrictions.
 - r. Working hours.
 - s. Owner's occupancy requirements.
 - t. Responsibility for temporary facilities and controls.
 - u. Procedures for moisture and mold control.
 - v. Procedures for disruptions and shutdowns.
 - w. Construction waste management and recycling.
 - x. Parking availability.
 - y. Office, work, and storage areas.
 - z. Equipment deliveries and priorities.
 - aa. First aid.
 - bb. Security.
 - cc. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and Owner's Commissioning Authority of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software site data files.
 - d. Submittal of written warranties.
 - e. Requirements for completing sustainable design documentation.
 - f. Requirements for preparing operations and maintenance data.
 - g. Requirements for delivery of material samples, attic stock, and spare parts.
 - h. Requirements for demonstration and training.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. Coordination of separate contracts.
 - m. Owner's partial occupancy requirements.
 - n. Installation of Owner's furniture, fixtures, and equipment.
 - o. Responsibility for removing temporary facilities and controls.
 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.

- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Status of sustainable design documentation.
 - 6) Deliveries.
 - 7) Off-site fabrication.
 - 8) Access.
 - 9) Site use.
 - 10) Temporary facilities and controls.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) Status of RFIs.
 - 16) Status of Proposal Requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
- 4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

Request for Information

Meydenbauer Center – Center Hall Remodel

Project No. 2026-01

To LMN Architects
Architect: 801 Second Avenue, Suite 501
Seattle, WA 98104
Attn: CA Contact

Owner: Bellevue Convention Center Authority
11100 NE 6th Street
Bellevue, Washington 98004

From Contractor
Contractor: Address
From: CA Contact

Document Reference:

(Drawing Sheet, Detail No. / Spec. Section)

☐ Architectural ☐ Civil ☐ Structural ☐ Mechanical ☐ Electrical ☐ Other _____

Request / Recommended Solution:

☐ Attachments

Date Required For Response: _____ Initiated By: _____
(Name) (Firm)

Architect's Response:

☐ Attachments

Response By: _____ Firm: _____ Date: _____

NOTE: This is not an authorization to proceed with work involving additional cost and/or time. Notification must be given in accordance with the Contract Documents if any response causes any change to the Contract Sum and/or Contract Time.

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ File

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Submittal schedule
 - 4. Construction schedule updating reports.
 - 5. Daily construction reports.
 - 6. Material location reports.
 - 7. Site condition reports.
 - 8. Unusual event reports.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.
 - 2. Section 013100 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. Section 013233 "Photographic Documentation" for submitting construction photographs.
 - 4. Section 013300 "Submittal Procedures" for Submittal Schedule and for submitting schedules and reports.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Baseline Schedule: An approved schedule that corresponds to the contracted scope of work, the contracted milestone dates, and the sequence of work.
- C. Contracted Work Scope: The scope of work represented in the schedule that is under contract with negotiated scope, milestone dates and Schedule of Values.
- D. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- E. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.
- F. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- G. Event: The starting or ending point of an activity.
- H. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- I. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- J. Major Area: A story of construction, a separate building, or a similar significant construction element.
- K. Milestone: A key or critical point in time for reference or measurement.
- L. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- M. Resource Loading: The allocation of labor and equipment necessary for completing an activity as scheduled.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
1. Working electronic copy of schedule file.
 2. PDF file.
- B. Submittals Schedule: Arrange the following information in a tabular format:
1. Scheduled date for first submittal.
 2. Specification Section number and title.
 3. Submittal category (action or informational).
 4. Name of subcontractor.
 5. Description of the Work covered.
 6. Scheduled date for Architect's and Construction Manager's final release or approval.
- C. Startup construction schedule.
1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- D. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- E. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- F. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports to contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.

2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
3. Total Float Report: List of activities sorted in ascending order of total float.

- G. Daily Construction Reports: Submit one copy with payment application.
- H. Material Location Reports: Submit one copy with payment application.
- I. Field Condition Reports: Submit one copy at time of discovery of differing conditions.
- J. Special Reports: Submit one copy at time of unusual event.

1.4 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 1. Review delivery dates for Owner-furnished products.
 2. Review schedule for work of Owner's separate contracts.
 3. Review time required for review of submittals and resubmittals.
 4. Review requirements for tests and inspections by independent testing and inspecting agencies.
 5. Review time required for completion and startup procedures.
 6. Review and finalize list of construction activities to be included in schedule.
 7. Review submittal requirements and procedures.
 8. Review procedures for updating schedule.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the Work from entities involved.
 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.6 SUBMITTAL SCHEDULE

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 2. Initial Submittal: Submit concurrently with initial schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 - a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
- B. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- C. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 - a. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 - a. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - b. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - c. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 - Submittal Procedures, in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 - d. Startup and Testing Time: Include not less than 14 days for startup and testing.
 - e. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's and Owner's administrative procedures necessary for certification of Substantial Completion
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion, .
- G. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
 1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.
 2. Contractor to provide updated construction cost cash flow to Owner on a monthly basis.
 3. Each activity cost shall reflect an accurate value subject to approval by Architect.
 4. Total cost assigned to activities shall equal the total Contract Sum.
- H. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

1.8 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.

- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

1.9 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 14 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than **30** days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and commissioning.
 - 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 - 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 - 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Sub-networks on separate sheets are permissible for activities clearly off the critical path.

- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
 - 1. Contractor or subcontractor and the Work or activity.
 - 2. Description of activity.
 - 3. Principal events of activity.
 - 4. Immediate preceding and succeeding activities.
 - 5. Early and late start dates.
 - 6. Early and late finish dates.
 - 7. Activity duration in workdays.
 - 8. Total float or slack time.
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 - 1. Identification of activities that have changed.
 - 2. Changes in early and late start dates.
 - 3. Changes in early and late finish dates.
 - 4. Changes in activity durations in workdays.
 - 5. Changes in the critical path.
 - 6. Changes in total float or slack time.
 - 7. Changes in the Contract Time.

1.10 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions.
 - 7. Accidents.
 - 8. Meetings and significant decisions.
 - 9. Unusual events (refer to special reports).
 - 10. Stoppages, delays, shortages, and losses.
 - 11. Meter readings and similar recordings.
 - 12. Emergency procedures.
 - 13. Orders and requests of authorities having jurisdiction.
 - 14. Change Orders received and implemented.
 - 15. Construction Change Directives received and implemented.
 - 16. Services connected and disconnected.
 - 17. Equipment or system tests and startups.
 - 18. Partial Completions and occupancies.
 - 19. Substantial Completions authorized.

1.11 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Concealed Work photographs.
 - 3. Periodic construction photographs.
 - 4. Final Completion construction photographs.
- B. Related Requirements:
 - 1. Section 012200 - Unit Prices for procedures for unit prices for extra photographs.
 - 2. Section 013300 - Submittal Procedures: for submitting photographic documentation.
 - 3. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
 - 4. Section 024119 "Selective Demolition" for photographic documentation before selective demolition operations commence.

1.3 INFORMATIONAL SUBMITTALS

- A. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Submit photos on thumb-drive and by uploading to web-based Project management software site as approved by Owner. Include copy of key plan indicating each photograph's location and direction.
 - 2. Identification: Provide the following information with each image description in file metadata tag in web-based Project management software site:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point, and direction.
 - g. Unique sequential identifier keyed to accompanying key plan.

1.4 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 4 megapixels, and at an image resolution of not less than 1200 by 1800 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- C. Metadata: Record accurate date, time and GPS location data from camera.
- D. File Names: Name media files with date, Project area and sequential numbering suffix.

1.5 CONSTRUCTION PHOTOGRAPHS

- A. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:
 - 1. Piping.
 - 2. Electrical conduit.
- B. Periodic Construction Photographs: Take (20) photographs weekly. Select vantage points to show status of construction and progress since last photographs were taken.
- C. Final Completion Construction Photographs: Take **[20]** **[50]** photographs after date of Substantial Completion for submission as Project Record Documents. Owner's Representative and Architect will inform photographer of desired vantage points.
- D. Additional Photographs: Owner or Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum or in the allowance for construction photographs.
 - 1. Three days' notice will be given, where feasible.
 - 2. In emergency situations, take additional photographs within 24 hours of request.
 - 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Special installation procedures and assemblies.
 - c. Immediate follow-up when on-site events result in construction damage or losses.
 - d. Photographs are to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - e. Substantial Completion of a major phase or component of the Work.
 - f. Extra record photographs at time of final acceptance.
 - g. Owner's request for special publicity photographs.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013233

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submittal schedule requirements.
 - 2. Administrative and procedural requirements for submittals.
 - 3. Delegated Design Submittals per IBC Section 107.3.4 as indicated. Contractor shall be responsible for expediting deferred submittals for approval by the authority having jurisdiction after Architect's review, and prior to fabrication and installation. Refer to Drawing Notes for complete listing of deferred submittals by subject.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
 - 3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 4. Section 013233 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs, and Final Completion construction photographs.
 - 5. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
 - 6. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Owner's and Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
 - 1. Product data
 - 2. Shop Drawings.
 - 3. Samples.
 - 4. Product Schedules.
 - 5. Submittal Schedules.
 - 6. Applications for Payment.
 - 7. Schedule of Values.
 - 8. Subcontract List.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Owner's and Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
 - 1. Preconstruction Submittals.
 - 2. Schedules.
 - 3. Certificates and Certifications.
 - 4. Special warranty forms.
 - 5. Test and inspection reports.
 - 6. Meeting minutes.
 - 7. Coordination drawings.

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Owner's Representative and Architect and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal Schedule: Submit concurrently with startup construction schedule.. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal Schedule: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule as required to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.4 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
 2. Date.
 3. Name of Architect.
 4. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
 5. Category and type of submittal.
 6. Submittal purpose and description.
 7. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
 8. Drawing number and detail references, as appropriate.
 9. Indication of full or partial submittal.
 10. Location(s) where product is to be installed, as appropriate.
 11. Other necessary identification.
 12. Remarks.
 13. Signature of transmitter.
- B. Options: Identify options requiring selection by Architect.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Owner's Representative and Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

- D. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
1. Assemble complete submittal package into a single indexed file with links (bookmarks) enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., XXXX-xx - 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., XXXX-xx - 061000.01. A).
 3. Where documents are scanned, scan resolution shall be sufficient for readability, but not less than 100 dpi.
 4. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 5. Transmittal shall constitute the Contractor's certification that the submittal has been reviewed and is proposed for incorporation into the work.
 6. Describe each submittal or submittal group under cover of an electronic transmittal. Submittals shall be grouped for individual, or like products. Include separate transmittals for unrelated products.
 7. Include the following information on an inserted cover sheet:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Name of subcontractor.
 - g. Name of supplier/vendor.
 - h. Name of manufacturer.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Related physical samples submitted directly.
 - m. Other necessary identification.
 8. Include the following information as keywords in the electronic file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- E. Options: Identify options requiring selection by the Architect.
- F. Deviations: Identify deviations from the Contract Documents on submittals.
- G. Transmittal: Assemble 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: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Contractor's signed approval.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.

- j. Indication of full or partial submittal.
 - k. Drawing number and detail references, as appropriate.
 - l. Transmittal numbered consecutively.
 - m. Submittal and transmittal distribution record.
 - n. Remarks.
 - o. Signature of transmitter.
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 identification information as related submittal.

1.5 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
- 1. Web-Based Project Management Software: Prepare submittals in PDF form, and upload to web-based Project management software website. Enter required data in web-based software site to fully identify submittal. Follow all instructions to alert Architect and Owner when submittals are uploaded.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
- 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections, so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect and Owner's Representative reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
- 1. Initial Review: Allow 14 calendar 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.
 - a. The Contractor shall notify the Owner whenever the Work is likely to be delayed or disrupted if the Architect's response to a submittal is not issued to Contractor within a particular time, which time period be reasonable and in no event before the target date for submittals responses of 10 business days. In all circumstances, the Architect and Contractor will closely coordinate and prioritize all submittals in order to respect the construction schedule.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 7 working days for review of each resubmittal.
- D. Resubmittals: Make resubmittals in same form 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 with graphic clouds.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL REQUIREMENTS

- A. Form: Make submittals as electronic files.
1. Electronic product data submittals shall not be locked or password protected.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. Product data submittals shall be sufficiently edited and/or annotated to clearly indicate the intended product, including of size(s), color(s), and selection of available accessories and options to be included, as appropriate.
 2. Brochures, catalog cuts, and other product data which do not clearly indicate specific products intended will be rejected.
 3. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 4. Mark each copy of each submittal to show which products and options are applicable.
 5. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 6. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 7. The Architect will review product data, annotate as necessary, and return it.
 - a. Data for products approved for incorporation into the work will be returned with Architect's submittal review stamp marked for appropriate action.
 - b. For electronically submitted data, where modifications to data indicated on the submittal are required by the Architect, such documents will be printed, revised and rescanned, or electronically modified and/or annotated, and may incorporate an additional page indicating action to be taken.
- 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 submittal based on Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

- a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Illustrate fully the requirements of the Specifications and the Contract Drawings, and accurately show quantities, kinds of materials, methods of assembly, and all data required for fabrication, erection, and installation.
 3. Show layout, details, materials, thicknesses, methods of assembly, attachments, the relationship of adjoining work, wiring diagrams, rough-in requirements, relevant field conditions and dimensions; coordinate with affected subcontractors and suppliers if in conflict. Clearly indicate field dimensions and field conditions.
 4. Electronic data of portions of the Contract Documents may be available for use as bases for preparation of shop drawings. The General Contractor shall be responsible for all subsequent distribution of such information to subcontractors and suppliers. Request documents by submitting an executed copy of the "Electronic Media Release Form" (EMR) form. Use of such documents implies Contractor's and subcontractors' agreement to the terms described on the form. Fully describe requirements for each request.
 5. The Architect will review shop drawings, annotate as necessary, and return them.
 - a. For electronically submitted shop drawings, where modifications are required by the Architect, such documents will be printed, revised and rescanned, or electronically modified and/or annotated, and may incorporate an additional page indicating action to be taken.
- D. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Except where specified otherwise, submit samples from full range of manufacturer's standard colors illustrating textures, patterns, and finishes for Architect selection.
 4. Where custom colors are specified, submit samples illustrating colors, textures, patterns, and finishes for Architect's review. Architect will advise colors required or furnish samples for color matching
 5. Web-Based Project Management Software: In addition to physical Samples as described above, prepare submittals in PDF form for the sake of tracking, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
 6. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

- E. Application for Payment: Comply with requirements specified in Section 012900 "Payment Procedures."
- F. Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- G. 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 Construction Specification Institute (CSI) Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entities 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.
- H. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- I. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
 - 1. Submit calculations bearing seal and signature of professional engineer responsible for design, registered in State of origin within jurisdiction of project.
 - a. Conformity to applicable governing codes.
 - b. Conformity to criteria in Contract Documents.
 - c. Component parts were designed or selected for locale and application intended.
 - 2. Furnish separate submittal indicating complete description of loads, forces, and moments transferred to "base building" structure at each point of contact.
 - 3. Include secondary forces resulting from connections used.
 - 4. Do not submit engineering calculations for support reactions.
 - 5. Where existing conditions deviate from Contract Documents or shop drawings, submit calculations for existing condition, including calculations for anticipated corrective action required, and changes to loads transferred to "base building" structure.
- J. Certificates:
 - 1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 - 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 - 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 - 4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
 - 5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
 - 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.
 - a. Submit copy of Contractor-obtained 'Hot-Work' permits.

- b. Submit certificates of compliance within two weeks following approval or acceptance by authority having jurisdiction.
 - K. Test and Research Reports:
 - 1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
 - 2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
 - a. Submit within two weeks following completion of field services covered in individual reports.
 - 3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
 - 4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
 - 5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
 - 6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.
- 1.7 SAFETY DATA SHEETS (SDS)
- A. Collect and file on the jobsite as required by Occupational Safety and Health Administration (OSHA) and other authorities.
 - B. Do not submit to the Architect. If the Owner requires that SDSs be submitted for the Owner's purposes, submit directly to the Owner, without passing through the Architect.
- 1.8 DELEGATED DESIGN SERVICES
- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
 - B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.9 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 1. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents. Contractor's stamp shall bear the words as follows: REVIEWED AND APPROVED FOR COORDINATION AND CONFORMANCE WITH CONTRACT DOCUMENTS.
 2. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.
 3. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Section 017700 "Closeout Procedures."

1.10 ARCHITECT'S REVIEW

- A. Architect will review construction progress schedules, submittal schedules, product lists, shop drawings, product data, and samples and return as described in Submittal Procedures article.
 1. Consultants' reviews will occur within scheduled time period with comments coordinated by Architect, prior to Architect's action stamp and return to Contractor.
- B. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return.
 1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action, as follows:
 - a. "No Exception Taken": No corrections or resubmittal required; fabrication may proceed.
 - b. "Make Corrections Noted": Comply with noted corrections and modifications; resubmittal not required; fabrication may proceed. If for any reason noted corrections and modifications cannot be fully complied with, resubmit for review requesting clarification; do not proceed with fabrication.
 - c. "Revise/Resubmit": Do not proceed with fabrication. Comply with noted corrections and resubmit per the Resubmittals article. Disapproved submittals will not be considered valid cause for construction delay
- C. The Architect will review submittals only for conformance with the design concept of the Project and general compliance with the information given in the Contract Documents. The Architect's approval of such submittals shall not relieve the Contractor from the following:
 1. Responsibility for confirming and correlating dimensions at job site for tolerances, clearances, quantities, and fabrication processes.
 2. For information that pertains solely to the means, methods, techniques, sequences, and procedures of construction, which should not be submitted.
 3. For deviations from drawings or specifications, unless they have in writing specifically called the Architect's attention to such deviations at the time of submission and secured their written approval.

4. For coordination of the Work with other trades.
 5. For installation of the Work in full compliance with the Construction Documents, and responsibility for providing work not indicated on the shop drawings, but otherwise required for the completion of the Work
- D. Submittal approval does not authorize changes to Contract requirements, unless accompanied by a Change Order, Architect's Supplemental Instruction, or Construction Change Directive.
- E. 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.
- F. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- G. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- H. Architect will return without review submittals received from sources other than Contractor.
- I. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

ELECTRONIC MEDIA RELEASE FORM

LMN Architects agrees to provide electronic information for the Meydenbauer Center: Center Hall Remodel project subject to the following terms and conditions. Electronic media will be furnished in Revit and/or Rhino format. Possession of the electronic media is evidence of recipient's acceptance of, and agreement with, the following conditions:

1. Due to the potential that information provided via electronic media (hereinafter referred to as "disk" or "electronic media") can be modified unintentionally or otherwise, LMN reserves the right to remove all indications of its ownership, name, and/or involvement from electronic media not in its possession.
2. The use of this electronic media is restricted to the original site and project for which it was prepared. Reuse or reproduction of the disk, data or documents prepared from, by or with this electronic media for any other purpose than that for which the material was intended, is strictly prohibited.
3. Electronic media will be furnished one time to the General Contractor who may in turn make either the media or its contents available to sub-contractors and suppliers. It is the responsibility of the G.C. to ensure that parties to whom this information is provided are made aware of and abide by all other terms and provisions of this agreement.
4. Recipient recognizes that information stored on electronic media, including, but not limited to, the electronic files posted to the project website may not be 100% compatible with their own computer system due to differences in computer hardware and software, or may be subject to translation errors. In addition, recipient recognizes that designs, plans and data stored on electronic media, including but not limited to the computer disk, may be subject to undetectable alteration and/or uncontrollable deterioration. If, for any reason, a conflict occurs between information contained in the electronic media and stamped, signed documents, the information on stamped, signed documents shall govern.
5. Considering the foregoing, the recipient recognizes and acknowledges that the use of such electronic media will be at their sole risk and without any liability or legal exposure to LMN. No warranties of any nature, whether express or implied, shall attach to the electronic media or the information contained thereon. Furthermore, recipient hereby releases and shall, to the fullest extent permitted by law, defend, indemnify and hold harmless LMN from any and all claims, damages, losses and expenses ("Claims") including attorney's fees arising out, or resulting from the use of such electronic media, including but not limited to, Claims involving the completeness or accuracy of any data or information contained on the electronic media.
6. Notwithstanding LMN's agreement to provide electronic information pursuant to this Agreement, nothing shall be construed to create contractual privity or benefit between recipient and LMN except as is necessary for LMN to enforce these express, limited terms and conditions.
7. Recipient agrees that this signed release form is to be received at the office of LMN Architects prior to receiving the electronic media.

AGREED:

Recipient Signature, Title

Date

Firm

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Specific Contractor scopes that require testing and inspections within their contractual obligations are limited to GMP document requirements, such as Elevators and Means and Methods, as applicable.
- C. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
- D. Related Requirements:
 - 1. Section 012100 "Allowances" for testing and inspection allowances.
 - 2. Section 013200 "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 3. Section 014339 "Mock-Ups"
 - 4. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.3 LANGUAGE:

- A. Imperative mood of sentence structure is generally used which places verb as first word in sentence. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor.
- B. In certain circumstances, the language of specifications and other contract documents are of abbreviated type. It implies words and meanings that will be appropriately interpreted. Words such as "the," "shall," "shall be," "Contractor shall," "a," "all," "an," "any," and other similar words are eliminated.
- C. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicates.
- D. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

1.4 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Inspector/Laboratory/ Inspection Laboratory/Testing/Testing Laboratory: An officially designated and accredited testing laboratory.
- D. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- E. Mockups: Full-size (or as requested by Architect) physical assemblies that are constructed either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. See Mock-ups list in Section 014339 "Mock-Ups".
 - 2. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.
 - 3. Integrated Exterior Mockups:
 - 4. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.
 - 5. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate aesthetic effects.
 - c. Demonstrate the qualities of products and workmanship.
 - d. Demonstrate successful installation of interfaces between components and systems.
 - e. Perform preconstruction testing to determine system performance.
 - 6. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 - 7. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- F. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- G. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) in accordance with 29 CFR 1910.7, by a testing agency accredited in accordance with NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

- H. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- J. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- K. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect[**or Construction Manager**].

1.5 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.6 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.7 ACTION SUBMITTALS

- A. Mockup Shop Drawings:
 - 1. See Mock-ups list in Section 014339 "Mock-Ups".
 - 2. Include plans, sections, elevations, and details, indicating materials and size of mockup construction.
 - 3. Indicate manufacturer and model number of individual components.
 - 4. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

- B. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Reports: Prepare and submit certified written reports and documents as specified.
- E. Submit test reports within 2 weeks of test date.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 REPORTS AND DOCUMENTS

- A. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, telephone number, and email address of technical representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 6. Statement of whether conditions, products, and installation will affect warranty.
 - 7. Other required items indicated in individual Specification Sections.
- B. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 - 2. Statement that equipment complies with requirements.
 - 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 4. Statement of whether conditions, products, and installation will affect warranty.
 - 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

- B. **Manufacturer Qualifications:** A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. **Fabricator Qualifications:** A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. **Installer Qualifications:** A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. **Professional Engineer Qualifications:** A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. **Specialists:** Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.
 - 1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. **Testing and Inspecting Agency Qualifications:** An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to the National Institute of Standards and Tech NIST's National Voluntary Laboratory Accreditation Program.
- H. **Manufacturer's Technical Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. **Factory-Authorized Service Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. **Mockups:** Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups of size indicated.
 - 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 - 3. Notify Architect and Owner's Representative seven days in advance of dates and times when mockups will be constructed.
 - 4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
 - 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 6. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.

- a. Allow seven days for initial review and each re-review of each mockup.
7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
10. Demolish and remove mockups when directed unless otherwise indicated.

1.10 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
 7. When inspections or tests cannot be performed after proper notification and at no fault of laboratory, reimbursement costs for laboratory expenses incurred will be charged to Contractor by deducting charges from Contract Sum.
- B. .

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms, including "requested," "authorized," "selected," "required," and "permitted," have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms, including "shown," "noted," "scheduled," and "specified," have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
 - 1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations, List: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list are to mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States." The

information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; (see FGIA).
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; www.concrete.org.
9. ACP - American Clean Power; (Formerly: American Wind Energy Association); www.cleanpower.org.
10. ACPA - American Concrete Pipe Association; www.concretepipe.org.
11. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
12. AF&PA - American Forest & Paper Association; www.afandpa.org.
13. AGA - American Gas Association; www.aga.org.
14. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
15. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
16. AI - Asphalt Institute; www.asphaltinstitute.org.
17. AIA - American Institute of Architects (The); www.aia.org.
18. AISC - American Institute of Steel Construction; www.aisc.org.
19. AISI - American Iron and Steel Institute; www.steel.org.
20. AITC - American Institute of Timber Construction; (see PLIB).
21. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
22. AMPP - Association for Materials Protection and Performance; www.ampp.org.
23. ANSI - American National Standards Institute; www.ansi.org.
24. AOSA/SCST - Association of Official Seed Analysts (The)/Society of Commercial Seed Technologists (The); www.analyzeseeds.com.
25. APA - APA - The Engineered Wood Association; www.apawood.org.
26. APA - Architectural Precast Association; www.archprecast.org.
27. API - American Petroleum Institute; www.api.org.
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASA - Acoustical Society of America; www.acousticalsociety.org.
30. ASCE - American Society of Civil Engineers; www.asce.org.
31. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (see ASCE).
32. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
33. ASME - ASME International; [**American Society of Mechanical Engineers (The)**]; www.asme.org.
34. ASSE - ASSE International; (American Society of Sanitary Engineering); www.asse-plumbing.org.
35. ASSP - American Society of Safety Professionals; www.assp.org.
36. ASTM - ASTM International; www.astm.org.
37. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
38. AVIXA - Audiovisual and Integrated Experience Association; www.avixa.org.
39. AWI - Architectural Woodwork Institute; www.awinet.org.
40. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
41. AWWA - American Water Works Association; www.awwa.org.
42. AWS - American Welding Society; www.aws.org.
43. AWWA - American Water Works Association; www.awwa.org.
44. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
45. BIA - Brick Industry Association (The); www.gobrick.com.

46. BICSI - BICSI, Inc.; www.bicsi.org.
47. BIFMA - Business and Institutional Furniture Manufacturer's Association; www.bifma.org.
48. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
49. BWF - Badminton World Federation; www.bwfbadminton.com.
50. CARB - California Air Resources Board; www.arb.ca.gov.
51. CDA - Copper Development Association Inc.; www.copper.org.
52. CE - Conformite Europeenne (European Commission); www.ec.europa.eu/growth/single-market/ce-marking.
53. CEA - Canadian Electricity Association; www.electricity.ca.
54. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
55. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
56. CGA - Compressed Gas Association; www.cganet.com.
57. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
58. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
59. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
60. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
61. CPA - Composite Panel Association; www.compositepanel.org.
62. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
63. CRRC - Cool Roof Rating Council; www.coolroofs.org.
64. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
65. CSA - CSA Group; www.csagroup.org.
66. CSI - Cast Stone Institute; www.caststone.org.
67. CSI - Construction Specifications Institute (The); www.csiresources.org.
68. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
69. CTA - Consumer Technology Association; www.cta.tech.
70. CTI - Cooling Technology Institute; www.coolingtechnology.org.
71. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
72. DHA - Decorative Hardwoods Association; www.decorativehardwoods.org.
73. DHI - Door and Hardware Institute; www.dhi.org.
74. ECIA - Electronic Components Industry Association; www.ecianow.org.
75. EIMA - EIFS Industry Members Association; www.eima.com.
76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
77. EOS/ESD - EOS/ESD Association, Inc.; Electrostatic Discharge Association; www.esda.org.
78. ESTA - Entertainment Services and Technology Association; www.esta.org.
79. EVO - Efficiency Valuation Organization; www.evo-world.org.
80. FCI - Fluid Controls Institute; www.fluidcontrolsintstitute.org.
81. FGIA - Fenestration and Glazing Industry Alliance; <https://fgiaonline.org>.
82. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
83. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
84. FM Approvals - FM Approvals LLC; www.fmapprovals.com.
85. FM Global - FM Global; www.fmglobal.com.
86. FRSA - Florida Roofing and Sheet Metal Contractors Association, Inc.; www.floridarroof.com.
87. FSA - Fluid Sealing Association; www.fluidsealing.com.
88. FSC - Forest Stewardship Council U.S.; www.fscus.org.
89. GA - Gypsum Association; www.gypsum.org.
90. GS - Green Seal; www.greenseal.org.
91. HI - Hydraulic Institute; www.pumps.org.
92. HMMA - Hollow Metal Manufacturers Association; (see NAAMM).
93. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
94. IAS - International Accreditation Service; www.iasonline.org.
95. ICC - International Code Council; www.iccsafe.org.

96. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
97. ICPA - International Cast Polymer Association (The); www.theicpa.com.
98. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
99. IEC - International Electrotechnical Commission; www.iec.ch.
100. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
101. IES - Illuminating Engineering Society; www.ies.org.
102. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
103. IGMA - Insulating Glass Manufacturers Alliance; (see FGIA).
104. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.org.
105. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
106. Intertek - Intertek Group; www.intertek.com.
107. ISA - International Society of Automation (The); www.isa.org.
108. ISFA - International Surface Fabricators Association; www.isfanow.org.
109. ISO - International Organization for Standardization; www.iso.org.
110. ITU - International Telecommunication Union; www.itu.int.
111. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
112. LPI - Lightning Protection Institute; www.lightning.org.
113. MBMA - Metal Building Manufacturers Association; www.mbma.com.
114. MCA - Metal Construction Association; www.metalconstruction.org.
115. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
116. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
117. MHI - Material Handling Industry; www.mhi.org.
118. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
119. MPI - Master Painters Institute; www.paintinfo.com.
120. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry, Inc.; www.msshq.org.
121. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
122. NACE - NACE International; (National Association of Corrosion Engineers International); (see AMPP).
123. NADCA - National Air Duct Cleaners Association; www.nadca.com.
124. NAIMA - North American Insulation Manufacturers Association; www.insulationinstitute.org.
125. NALP - National Association of Landscape Professionals; www.landscapeprofessionals.org.
126. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
127. NBI - New Buildings Institute; www.newbuildings.org.
128. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
129. NCMA - National Concrete Masonry Association; www.ncma.org.
130. NEBB - National Environmental Balancing Bureau; www.nebb.org.
131. NECA - National Electrical Contractors Association; www.necanet.org.
132. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
133. NEMA - National Electrical Manufacturers Association; www.nema.org.
134. NETA - InterNational Electrical Testing Association; www.netaworld.org.
135. NFHS - National Federation of State High School Associations; www.nfhs.org.
136. NFPA - National Fire Protection Association; www.nfpa.org.
137. NFPA - NFPA International; (see NFPA).
138. NFRC - National Fenestration Rating Council; www.nfrc.org.
139. NGA - National Glass Association; www.glass.org.
140. NHLA - National Hardwood Lumber Association; www.nhla.com.
141. NLGA - National Lumber Grades Authority; www.nlga.org.
142. NOFMA - National Oak Flooring Manufacturers Association; (see NWFA).
143. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
144. NRCA - National Roofing Contractors Association; www.nrca.net.
145. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
146. NSF - NSF International; www.nsf.org.

147. NSI - Natural Stone Institute; www.naturalstoneinstitute.org.
148. NSPE - National Society of Professional Engineers; www.nspe.org.
149. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
150. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
151. NWFA - National Wood Flooring Association; www.nwfa.org.
152. NWRA - National Waste & Recycling Association; www.wasterecycling.org.
153. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
154. PDI - Plumbing & Drainage Institute; www.pdionline.org.
155. PLASA - PLASA; www.plasa.org.
156. PLIB - Pacific Lumber Inspection Bureau; www.plib.org.
157. PVCPA - Uni-Bell PVC Pipe Association; www.uni-bell.org.
158. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
159. RFCI - Resilient Floor Covering Institute; www.rfci.com.
160. RIS - Redwood Inspection Service; (see WWPA).
161. SAE - SAE International; www.sae.org.
162. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
163. SDI - Steel Deck Institute; www.sdi.org.
164. SDI - Steel Door Institute; www.steeldoor.org.
165. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
166. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (see ASCE).
167. SIA - Security Industry Association; www.securityindustry.org.
168. SJI - Steel Joist Institute; www.steeljoist.org.
169. SMA - Screen Manufacturers Association; www.smainfo.org.
170. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
171. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
172. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
173. SPIB - Southern Pine Inspection Bureau; www.spib.org.
174. SPRI - Single Ply Roofing Industry; www.spri.org.
175. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
176. SSINA - Specialty Steel Industry of North America; www.ssina.com.
177. SSPC - SSPC: The Society for Protective Coatings; (see AMPP).
178. STI/SPFA - Steel Tank Institute/Steel Plate Fabricators Association; www.steeltank.com.
179. SWI - Steel Window Institute; www.steelwindows.com.
180. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
181. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
182. TCNA - Tile Council of North America, Inc.; www.tcnatile.com.
183. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.kbcdco.tema.org.
184. TIA - Telecommunications Industry Association (The); www.tiaonline.org.
185. TMS - The Masonry Society; www.masonrysociety.org.
186. TPI - Truss Plate Institute; www.tpinst.org.
187. TPI - Turfgrass Producers International; www.turfgrasssod.org.
188. TRI - Tile Roofing Industry Alliance; www.tilerroofing.org.
189. UL - Underwriters Laboratories Inc.; www.ul.org.
190. UL LLC - UL LLC; www.ul.com.
191. USAV - USA Volleyball; www.usavolleyball.org.
192. USGBC - U.S. Green Building Council; www.usgbc.org.
193. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
194. WA - Wallcoverings Association; www.wallcoverings.org.
195. WCLIB - West Coast Lumber Inspection Bureau; (see PLIB).
196. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
197. WDMA - Window & Door Manufacturers Association; www.wdma.com.
198. WI - Woodwork Institute; www.woodworkinstitute.com.
199. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.

200. WWPA - Western Wood Products Association; www.wwpa.org.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Mockup of re-surfaced fabric wall panels
- B. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for quality assurance requirements for aesthetic and workmanship mockups specified in other Sections.

1.3 DEFINITIONS

- A. Mock up Definition: Full size physical assemblies, construction on site, that incorporate several materials or elements of construction. Mockups are erected for Architect's review and approval of exterior and interior visual features and workmanship. Mockups represent quality of materials, interface between dissimilar materials and workmanship, unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1.4 QUALITY ASSURANCE

- A. Build mockups to do the following:
 - 1. Verify selections made under Sample submittals.
 - 2. Demonstrate aesthetic effects.
 - 3. Demonstrate the qualities of products and workmanship.
 - 4. Demonstrate acceptable coordination between components and systems.
- B. Fabrication: Before fabricating or installing portions of the Work requiring mockups, build mockups for each form of construction and finish required. Use materials and installation methods as required for the Work. Simulate actual construction conditions as accurately as possible.
 - 1. Build mockups of size indicated with approved mock-up coordination drawings.
 - 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 - 3. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
 - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed unless otherwise indicated.
- C. Construct mockups in a timely manner to permit review and modification such that work is not delayed.
- D. Notifications:
 - 1. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.

- E. Approval: Obtain Architect's approval of mockups before starting fabrication or construction of corresponding Work.
 - 1. Do not complete production of materials for final Project site erection until Architect's approval of mock up has been obtained.
 - 2. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
 - 5. Where the mock-up is rejected or testing of mock-up fails to meet performance criteria included under Related Sections, replace, rebuild and or modify mock-up as directed by Architect.
- F. Stand-Alone Mock-Ups: Provide mock-ups in locations on site approved by Architect and Owner and comply with requirements indicated above for in-place mock-ups.
 - 1. Mock-ups shall remain on site, as the standard for completing the Work, until approved otherwise by the Architect.
- G. Removal of Mock-Ups: Upon completion of relevant Work, or when directed by the Architect, Contractor shall demolish and remove mock-ups, both stand-a-long and rejected in place mock-ups, at no additional cost to the Work.

1.5 COORDINATION

- A. Coordinate schedule for construction of mockups, so construction, testing, and review of mockups do not impact Project schedule.

1.6 MOCKUPS SCHEDULE

- A. Stretched fabric over existing panel system (**ASFW-01**): Mockup minimum area of one panel high by one panel wide (from MDF strip to MDF strip). Intent is to review quality of installation per this specification and to evaluate effectiveness of scrim/fabric assembly at obscuring the core elements.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. Protect Mock-ups until completion of relevant work.

END OF SECTION 014339

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Section 012100 "Allowances" for allowance for metered use of temporary utilities.
 - 3. Section 015800 "Project Identification (Signage)"
 - 4. Section 018113 "Sustainable Design Requirements" for general requirements and procedures related to sustainable design and construction.
 - 5. Section 018119 "Indoor Air Quality Requirements" for construction IAQ requirements/plan and Owner pre-occupancy IAQ requirements/plan.

1.3 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities to be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- C. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.
- D. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use with metering. Provide connections and extensions of services and metering as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Implementation and Termination Schedule: Within 10 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Erosion and Sedimentation-Control Plan: Show compliance with requirements of United States Environmental Protection Agency (EPA) Construction General Permit or authorities having

jurisdiction, whichever is more stringent. Refer to Section 015723 "Temporary Storm Water Pollution Control" for additional requirements.

- E. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- F. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
 - 1. Refer to Section 018119 "Indoor Air Quality Requirements" for additional Requirements.
 - 2. Locations of dust-control partitions at each phase of work.
 - 3. HVAC system isolation schematic drawing.
 - 4. Location of proposed air-filtration system discharge.
 - 5. Waste-handling procedures.
 - 6. Other dust-control measures.
- G. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by Owner. Include the following:
 - 1. Methods used to meet the goals and requirements of Owner.
 - 2. Concrete cutting method(s) to be used.
 - 3. Location of construction devices on the site.
 - 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
 - 5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with Owner.
 - 6. Indicate locations of sensitive equipment areas or other areas requiring special attention as identified by Owner. Indicate means for complying with Owner's requirements.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the DOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches minimum.
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

- A. Field Offices:
 - 1. Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading. At contractor option, field office can be located in an existing office within the facility. Available space is approximately 15'-6" x 14'.
 - 2. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

2.4 TEMPORARY HEATING AND VENTILATING

- A. Provide temporary and ventilating system that complies with codes and regulations as necessary to maintain specified conditions during construction.
- B. Provide and pay for costs of supervision, operation, maintenance, fuel, and energy consumed.
- C. Except where indicated otherwise in individual Specification sections, maintain minimum ambient temperature of 50 degrees F in enclosed areas where construction is in progress; maintain humidity levels to within levels required to allow construction to proceed without affecting manufacturer's accepted installation procedures and warranty certification.
 - 1. Incorporate temporary means to prevent moisture accumulation in building assemblies within manufacturer's acceptable limits by use of dehumidification equipment designed for 24 hour operation, complete with monitoring and notification capability similar to Munters Corporation Moisture Control Services.
 - 2. Do not use propane fired equipment for temporary heating and moisture control.
- D. Use of permanent heating/ventilating and associated distribution systems will be permitted only upon meeting following requirements:
 - 1. Verify that installation is approved for operation, equipment is lubricated, and filters are in place.
 - 2. Equipment installed complete with accessories, started-up, maintained, serviced, and operated in strict accordance with manufacturer's instructions.
 - 3. Provide and pay for regular replacement of filters and worn or consumed parts.
 - 4. Operation of permanent systems or any portion thereof to provide temporary heat/ventilation does not constitute acceptance of system or portion of system.

5. Immediately before Substantial Completion, completely clean each permanent unit used, install new filters, and perform service functions required for placing units in use and qualifying for specified warranties.
- E. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 1. Locate facilities to limit site disturbance as specified in Section 011000 "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.
- C. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed in accordance with coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area, using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service:

1. Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary eyewash facilities and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 1. Use of Permanent Toilets: Use of Owner's existing toilet facilities is available.
- E. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Electric Power Service:
 1. Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
 - a. Connect temporary service to Owner's existing power source, as directed by Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment with suitable coverage and bandwidth for entire jobsite.
 1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Contractor's emergency after-hours telephone number.
 - e. Architect's office.
 - f. Engineers' offices.
 - g. Owner's office.
 - h. Principal subcontractors' field and home offices.
- I. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by Architect and Owner.

3.4 SUPPORT FACILITIES INSTALLATION

- A. Comply with the following:
 1. In coordination with Owner's Representative, the Contractor may utilize designated area within existing building for temporary field offices.
 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Parking: Provide temporary offsite parking when necessary and use designated areas of Owner's existing parking areas for construction personnel.
- C. Storage and Staging: Provide temporary offsite area when necessary and use designated areas of Project site for storage and staging needs.

- C. Storage and Staging: Provide temporary offsite area when necessary and use designated areas of Project site for storage and staging needs.
- D. Waste Disposal Facilities:
 - 1. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- E. Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
 - 1. Do not load elevators beyond their rated weight capacity.
 - 2. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work, so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.
- F. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas, so no evidence remains of correction work.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- B. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- C. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
 - 1. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 2. Insulate partitions to control noise transmission to occupied areas.
 - 3. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 - 4. Protect air-handling equipment.
 - 5. Provide walk-off mats at each entrance through temporary partition.
- D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.

3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

- A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.
- B. Refer to Section 018119 "Indoor Air Quality Requirements". Ensure all requirements align.
- C. Exposed Construction Period: When materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may

have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

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. The Work of This Section Includes: Administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for Contractor requirements related to Owner-furnished products.
 - 2. Section 012100 "Allowances" for products selected under an allowance.
 - 3. Section 012300 "Alternates" for products selected under an alternate.
 - 4. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 5. Section 014200 "References" for applicable industry standards for products specified.
 - 6. Section 017700 "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products unless otherwise indicated.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.
 - 1. Evaluating Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.

- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
 - 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 - 2. Data indicating compliance with the requirements specified in "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."
- F. Substitution: Refer to Section 012500 "Substitution Procedures" for definition and limitations on substitutions.

1.4 SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include product data and shop drawings to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 013300 - Submittal Procedures.
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
 - 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is inconspicuous.
 - 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.

- c. Capacity.
- d. Speed.
- e. Ratings.
- 3. See individual identification Sections in Divisions 21, 22, 23, 26, 27 and 28 for additional equipment identification requirements.

1.6 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.
- C. Storage:
 - 1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
 - 2. Store products to allow for inspection and measurement of quantity or counting of units.
 - 3. Store materials in a manner that will not endanger Project structure.
 - 4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
 - 5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 7. Protect stored products from damage and liquids from freezing.

1.8 PRODUCT WARRANTIES

- A. Warranties specified in other Sections are to be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of Owner or endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of Owner or endorsed by manufacturer to Owner.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
 - 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
 - 1. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
 - 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.
- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation as specified in Section 013300 "Submittal Procedures."
 - 1. Architect's Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
 - 2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Two-Step Process: Approval by Architect of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Installation.
 - 3. Cutting and patching.
 - 4. Progress cleaning.
 - 5. Protection of installed construction.
 - 6. Correction of the Work.
- B. Related Requirements:
 - 1. Section 015000 "Temporary Facilities and Controls" for temporary use of permanent systems prior to Substantial Completion
 - 2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 3. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.
 - 4. Section 078413 "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.

- d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
 - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 - 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
 - 5. Contractor shall pay cutting and patching costs caused by ill-timed or defective work, or work not conforming to the Contract Documents, including costs for additional services of the Architect.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
 - 2. Where surfaces are deteriorated beyond level of reparation indicated in respective technical sections, provide additional cleaning and surface preparation as required by the respective patching and repair materials manufacturer to properly install materials.
 - 3. Where supplementary material are indicated to cover existing substrates and assemblies, provide in accordance with best standards of practice and install in manner to match adjacent substrates and finishes as indicated.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Refer to Section 018119 - Indoor Air Quality Requirements for prohibited chemical constituents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Examine roughing-in for electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. 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.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. 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 in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.
 1. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 2. Inform installers of lines and levels to which they must comply.
 3. Check the location, level and plumb, of every major element as the Work progresses.
 - a. Check every major element for line, level, and plumb.
 4. Notify Architect when deviations from required lines and levels exceed allowable tolerances.

3.4 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 1. Make vertical work plumb, and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.
- J. Repair or remove and replace damaged, defective, or nonconforming Work.
1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.5 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Preparation: Provide materials and control operations to prevent spread of dust in surrounding area. Provide drop cloths or other suitable barriers.
- H. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Bypass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- I. Fitting: Perform using skilled craftsmen.
 - 1. Execute fitting and adjustment to produce finished installation complying with specified products, functions, tolerances, and finishes.
 - 2. Fit work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
 - 3. At penetrations of fire rated assemblies, completely seal with firestops in accordance with Section 078413 – Penetration Firestopping.
- J. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

- a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- K. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, in accordance with regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Schedule cleaning operations so that dust and other contaminants will not fall on or adhere to wet or newly coated surfaces.
 - 5. Do not throw materials from heights.
 - 6. Open free-fall chutes not permitted. Terminate closed chutes into appropriate containers with lids.
- 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 in accordance with 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: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls" and Section 017419 "Construction Waste Management and Disposal."
- 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 ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 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.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Description of a Job-Site Construction Waste Management Plan
 - 2. Job-Site Waste Reduction Requirements
- B. Related Sections:
 - 1. Section 013300 – Submittal Procedures
- C. Drawings, the provisions of the Agreement, the General Conditions, and Division 1 specification sections apply to work of this Section.
- D. Job Site Waste Reduction Requirements
 - 1. Divert through salvage, reuse and/or recycle at least 75% if the Contractor verifies that it is a realistic goal) of all C&D waste generated. Calculations may be based on dry weight or volume, but must be consistent throughout.
 - 2. To achieve these goals the Contractor shall develop for review a Waste Management Plan for this Project.
 - 3. Sub-contractors must report all waste and how much was diverted that they take off site that is not controlled through the on-site collection system being monitored by your CWM plan.
 - 4. Contractor should focus on generating less waste, rather than just diverting waste from the landfill/disposal.
- E. Substitutions: Substitutions will be considered only under the terms and conditions of Section 012500.

1.2 REFERENCES

- A. Resources available from the King County Solid Waste Division Construction Recycling and Green Building Program (<http://your.kingcounty.gov/solidwaste/greenbuilding/county-green-building.asp>) and the Seattle Business Industry and Resource Venture (www.resourceventure.org) include:
 - 1. King County Solid Waste Division Report of Co-mingled Recycling Facilities. This report lists the monthly co-mingled C&D recycling rate of local MRFs (material recovery facilities) and the materials each facility accepts. The report is available at <http://your.kingcounty.gov/solidwaste/greenbuilding/rates.asp>.
 - 2. A sample Waste Management Plan to use as a guide. <http://your.kingcounty.gov/solidwaste/greenbuilding/specifications-plans.asp>
 - 3. "Prevent Jobsite Waste" Guidelines to prevent waste for occurring in the first place. <http://your.kingcounty.gov/solidwaste/greenbuilding/jobsite-waste.asp>

2.1 SUBMITTALS

- A. Make submittals in accordance with Section 013300 – Submittal Procedures.
- B. Within fourteen (14) days after receipt of Notice of Award and prior to any waste removal by the Contractor from the Project, the Contractor shall develop and submit to the Owner for review a draft Construction Waste Management Plan.

The waste management plan shall include:

1. Types and estimated quantities (where reasonably available) of salvageable materials that are expected to be generated during demolition. Calculations may be based on dry weight or volume but must be consistent throughout.
2. The method to be used to recycle these materials. Methods shall include one or more of the following options: contracting with a demolition specialist to salvage all or most of materials generated, selective salvage as part of demolition contractor's work, or reuse of materials on-site or in new construction. Use the recycling rates and list of material accepted provided *King County Solid Waste Division Report of Co-mingled Recycling Facilities* to determine which waste materials on this project will be source-separated or co-mingled in each construction phase. See Section 1.2.B.1 for where to view the report online.
3. Types and estimated quantities (where reasonably available) of recyclable materials expected to be generated during construction in significant amounts including but not limited to wood, concrete, metals, cardboard, and drywall. Calculations may be based on weight or volume, but must be consistent throughout.
4. The method to be used to recycle these materials. Methods shall include one or more of the following options: requiring subcontractors to take materials back for recycling at a permitted facility, contracting with a full service recycling service to recycle all or most materials at a permitted facility, or processing or reusing materials on-site. Use the recycling rates and list of material accepted provided *King County Solid Waste Division Report of Co-mingled Recycling Facilities* to determine which waste materials on this project will be source-separated or co-mingled in each construction phase. See Section 1.2.B.1 for where to view the report online.
5. At a minimum, the waste management plan shall be designed to divert the following waste categories from the landfill
 - Cardboard (from supplies and packaging)
 - Carpet and carpet pad
 - Fluorescent tubes and ballasts (if not recycled designate as hazardous waste)
 - Gypsum drywall (clean, unpainted)
 - Metals (Concrete reinforcing steel, structural and miscellaneous steel, doors/frames, studs)
 - Paint
 - Plastic film (sheeting, shrink wrap, packaging)
 - Wood (clean, unpainted, untreated wood scrap including pallets and engineered wood, trim and paneling)
 - Job-shack wastes, including office paper, blueprints, pop cans and bottles, and office cardboard.

- Insulation

- C. Final Construction Waste Management Plan. Within 14 days after Owner has determined that the recycling options addressed in the draft Construction Waste Management Plan are acceptable and prior to waste removal, submit the final Construction Waste Management Plan. Use the recycling rates and list of material accepted provided King County Solid Waste Division Report of Co-mingled Recycling Facilities to determine which waste materials on this project will be source-separated or co-mingled in each construction phase. See Section 1.2.B.1 for where to view the report online.
- D. Progress Reports. Submit with each Application for Payment a summary of construction waste generated. Include the following:
 - 1. For each material recycled, reused, or salvaged from the Project, the amount (in tons or cubic yards), the receiving party, and the net total cost or savings of salvage or recycling the material. Attached manifests, weight tickets receipts or invoices. For co-mingled materials, the Contractor shall include the co-mingled C&D recycling rate of the receiving facility.
 - 2. The amount (in tons or cubic yards) of material disposed of as garbage from the Project, the location of the Receiving Facility, and the total disposal cost. Include manifests, weight tickets, receipt, and invoices.
 - 3. The Contractor shall be responsible for providing such information whether directly involved in recycling the materials or not (whether the Contractor performs recycling tasks or hires or requires others to do so, such as subcontractors to haul their own drywall or metal).
- E. Final Report: The Contractor shall submit within (14) calendar days of completing the project a final waste management report of waste generated at the Project. The final report shall be submitted on a form acceptable to the Owner's Project Manager and shall contain the following information:
 - 1. For each material recycled, reused, or salvaged from the Project, the total amount (in tons or cubic yards), the receiving party, and the net total cost or savings of salvage or recycling the material. Attached manifests, weight tickets receipts or invoices. For co-mingled materials, the Contractor shall include the co-mingled C&D recycling rate of the receiving facility.
 - 2. The total amount (in tons or cubic yard of material) of material disposed of as garbage from the Project, the location of the Receiving Facility, and the total disposal cost. Include manifests, weight tickets, receipt, and invoices.
 - 3. The Contractor shall be responsible for providing such information whether directly involved in recycling the materials or not (whether the Contractor performs recycling tasks or hires or requires others to do so, such as subcontractors to haul their own drywall or metal).

2.2 DEFINITIONS

- A. Waste: For the purpose of this section, the term applies to all excess building materials. Waste includes materials that can be salvaged, returned, recycled, or reused.
- B. Trash (or Garbage): That part of the waste that cannot be returned, reused, recycled, or salvaged.
- C. Construction & Demolition Waste (C&D): All non-hazardous solid wastes resulting from

construction and demolition activities. C&D waste includes, but is not limited to, building materials, demolition rubble, landscaping materials, soils, packaging materials, debris, and trash.

- D. Proper Disposal: As defined by the jurisdiction receiving the waste.
 - E. Landfill: Public or private business involved in the practice of trash disposal.
 - F. Hazardous Waste: Any material or byproduct of construction that is regulated by Environmental Protection Agency and that may not be disposed in landfill or other waste end-source without adherence to applicable laws.
 - G. Material Recovery Facility (MRF): A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures are used to recover recyclable materials from other waste, which is then disposed of as trash.
 - H. Recycling: The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product. Can be conducted on site (as in the grinding of concrete and reuse on site).
 - I. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of a new product. Recycling facilities have their own specifications for accepting materials. Depending on the type of facility, it may accept source-separated waste or co-mingled waste or both.
 - J. Recycling Services. Types of services include:
 - 1. Source-Separated: Construction waste is sorted on the job-site in separate containers as it is generated. The recycling hauler takes the materials directly to a recycler or a transfer site.
 - 2. Co-mingled: This service allows contractors to put select recyclables such as wood, cardboard, and metals in one container. The recycling hauler takes the materials to a sorting facility where the materials are separated for recycling.
 - K. Reuse: Making use of a material without altering its form.
 - L. Salvage: Recovery of materials for on-site reuse or donation to a third party.
 - M. Source-separated Materials: Materials that are sorted at the site for the purpose of reuse or recycling.
 - N. Co-mingled Materials: Mixed recyclable C&D material that has not been source-separated. Some facilities will separate co-mingled materials off-site for recycling.
- 2.3 REVENUES
- A. Revenues or other savings obtained from recycled, reused, or salvaged materials shall accrue to Contractor unless otherwise noted in the Contract Documents.

PART 2 - PRODUCTS

2.1 ENVIRONMENTALLY PREFERABLE MATERIALS

- A. Recycled-content, salvaged, rapidly renewable, or otherwise resource-efficient products are specified in appropriate sections.

PART 3 - EXECUTION

3.1 COMMUNICATION

- A. Designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project.
- B. Distribute copies of the Construction Waste Management Plan to each entity performing work at the site.
- C. Use safety meetings, signage, and subcontractor agreements to communicate the goals of the waste reduction plan, including instruction about appropriate separation, handling separation, handling, and recycling, salvage, reuse and return methods to be used by all parties at the appropriate stages of the Project.
- D. Sub-contractors must report all waste and how much was diverted that they take off site that is not controlled through the on-site collection system being monitored by your CWM plan.

3.2 MATERIALS CONSERVATION

- A. Protect products from damage during storage, installation, and in-place. Materials that become wet or damp due to improper storage shall be replaced at contractor's expense.
- B. Include in supply agreements a waste reduction provision specifying a preference for reduced, returnable, and/or recyclable packaging.
- C. Use detailed take-offs and use to identify location and use in structure to reduce risk of unplanned and potentially wasteful cuts.

3.3 MATERIALS HANDLING

- A. Designate specific area(s) to facilitate separation of materials for potential recycling, salvage, reuse and return. Maintain recycling and waste bin areas clean and clearly marked to avoid co-mingling of materials. Bins shall be protected during non-working hours from off-site contamination.
 - 1. Separate recycling waste in accordance with requirements of recycling facility/hauler.
- B. Protect materials to be recycled or reused from contamination. Handle, store, and transport materials in a manner that meets the requirements of the designated acceptance facility.

- C. Separately store and dispose of hazardous wastes according to local regulations.
- D. As part of regular clean-up, schedule and conduct visual inspections of dumpsters and recycling bins to identify potential contamination of materials.
- E. Burning or burring of C&D waste is not permitted.

3.4 WASTE DIVERSION FORM

A. Example Form:

Seq	Date	Material Type	Qty of Waste	Waste/ Ton	% of Waste Diverted	Total Diverted	Subcontracting Hauler	Facility Used	Notes
1.1	Mm/Dd/Yy	Co-mingled Debris	0.00%	X.X ton	NN.NN%	NN.NN	Hauler Name	Facility Name	
1.2	Mm/Dd/Yy	Gypsum	0.00%	X.X ton	100.00%	NN.NN	Hauler Name	Facility Name	
1.3	Mm/Dd/Yy	Concrete	0.00%	X.X ton	100.00%	NN.NN	Hauler Name	Facility Name	
1.4	Mm/Dd/Yy	Metal	0.00%	X.X ton	100.00%	NN.NN	Hauler Name	Facility Name	
1.5	Mm/Dd/Yy	"Material"	0.00%	X.X ton	NN.NN%	NN.NN	Hauler Name	Facility Name	
1.6	Mm/Dd/Yy	"Material"	0.00%	X.X ton	NN.NN%	NN.NN	Hauler Name	Facility Name	
		Total Waste Stream	0.00%			NN.NN	Total Material Diverted		
						NN.NN	Diversion Rate		

Notes:

- For commingled loads, the date reported is the closing date of the facility's monthly recycling report: typically, the last day of the month. This includes all commingled loads transported to the facility.
- For commingled loads, the percent of waste diverted is the diversion rate reported by the recycling facility for that month
- For site-separated materials, the diversion rate is 100%
- The subcontractor is the hauler for the jobsite.

END OF SECTION 017419

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final Completion procedures.
 - 3. List of incomplete items.
 - 4. Submittal of Project warranties.
 - 5. Submittal of Operation and Maintenance manuals.
 - 6. Final cleaning.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Section 013233 "Photographic Documentation" for submitting Final Completion construction photographic documentation.
 - 3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

1.3 DEFINITIONS

- A. List of Incomplete Items (Punch List) : Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.4 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. General: Complete items in following paragraphs before requesting Certification of Substantial Completion, either for entire Work or for portions of Work.
- B. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list, reasons why

the Work is incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.

- C. Submit written statement showing accounting of changes to Contract Sum.
- D. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number.
 - 5. Submit testing, adjusting, and balancing records.
 - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- E. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Advise Owner of pending insurance changeover requirements.
 - 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 3. Complete startup and testing of systems and equipment.
 - 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 - 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 - 6. Advise Owner of changeover in utility services.
 - 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 - 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 9. Complete final cleaning requirements.
 - 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.8 OPERATIONS AND MAINTENANCE MANUALS

- A. Prepare data in form of instructional manual in electronic files in PDF format and in heavy-duty three-ring binders with durable plastic covers.
 - 1. Where written instructions are required, use personnel skilled in technical writing to extent necessary for communication of essential data.
 - 2. Where drawings or diagrams are required, use personnel capable of preparing drawings clearly in understandable format.
- B. Examine for completeness.

- C. Submit one copy of completed volumes in final form after instructing Owner's personnel, but prior to request for Substantial Completion. This copy will be returned with Architect's comments. Revise as necessary prior to final submittal.
- D. Prepare and insert additional data in manuals when need for such data becomes apparent during Owner's instruction.
- E. Submit 1 physical copy of final volumes at time of request for Substantial Completion.
- F. Label covers and spine of binder with typed or printed title OPERATIONS AND MAINTENANCE MANUAL, title of project, and subject matter of binder when multiple binders are required.
- G. Separate contents with tab dividers, logically organized with tab title clearly printed under reinforced laminated plastic tabs.
- H. Manuals shall contain:
 - 1. Table of contents.
 - 2. Directory listing names, addresses, and telephone numbers of Architect, Consultants, and Contractor.
 - 3. List names, addresses and telephone numbers of subcontractors, suppliers, and service representatives, including local source of supplies and replacement parts.
 - 4. General system or equipment description.
 - 5. Copies of applicable shop drawings and product data.
 - 6. Mark product data to clearly identify specific products and component parts.
 - 7. Supplement product data with drawings necessary to illustrate relationship of component parts of equipment and systems, include control and flow diagrams.
 - 8. Arranged by product, system, or process flow, and subdivided by Specification section. Identify following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. System or equipment identification, including:
 - d. Name of manufacturer.
 - e. Model number.
 - f. Serial number of each component.
 - g. Parts list for each component.
 - h. Operating instructions.
 - i. Maintenance instructions and schedules for equipment and systems.
 - j. Emergency instructions.
 - k. Wiring and piping diagrams; color coding.
 - l. Inspection and test procedures.
 - m. Precautions against improper use and maintenance.
 - 9. Copies of warranties.

1.9 SUBSTANTIAL COMPLETION REVIEW

- A. When Contractor considers Work to be substantially complete, submit to Architect:
 - 1. Written certificate that Work, or designated portion, is substantially complete.
 - 2. List of items to be completed or corrected (initial punch list).
- B. Within 7 days after receipt of request for Substantial Completion, Architect will make site review to determine whether Work or designated portion is substantially complete following procedures indicated in Conditions of the Contract.
- C. Should Architect determine that Work is not substantially complete:
 - 1. Architect will promptly notify Contractor in writing, stating reasons for its opinion.

2. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Architect.
 3. Architect will re-perform review of Work.
 - D. When Architect finds that Work is substantially complete, Architect will:
 1. Prepare Certificate of Substantial Completion on AIA Form G704 accompanied by Contractor's list of items to be completed or corrected as verified and amended by Architect and Owner (final punch list).
 2. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate.
 - E. After Work is substantially complete, Contractor shall:
 1. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion (AIA Document G704).
 2. Complete work listed for completion or correction within time period stipulated
- 1.10 PREREQUISITES FOR FINAL COMPLETION
- A. Complete items in following paragraphs before requesting final acceptance and final payment. List known exceptions, if any, in request.
 - B. When Contractor considers Work to be complete, submit written certification that:
 1. Contract Documents have been reviewed.
 2. Work has been examined for compliance with Contract Documents.
 3. Work has been completed in accordance with Contract Documents.
 4. Work is completed and ready for final inspection.
 - C. Submit final punch list indicating all items have been completed or corrected.
 - D. Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required in accordance with the Conditions of the Contract.
 - E. Submit specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents in accordance with individual sections.
 - F. Submit records of training sessions for new building and laboratory equipment in accordance with Related Sections.
 - G. Submit updated accounting statement for final changes to Contract Sum.
 - H. Submit consent of surety to final payment.
 - I. Perform final cleaning for Contractor soiled areas in accordance with Section 017400 - Cleaning.
- 1.11 FINAL COMPLETION PROCEDURES
- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
 1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed

- and dated by Architect. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
 - a. Submit updated accounting statement for final changes to Contract Sum.
 - b. Submit consent of surety to final payment.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed in accordance with Contract Documents.
 - d. Work is completed and ready for final inspection.
 - 5. Submit Final Completion photographic documentation.
 - 6. Submit specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor in writing of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
- 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.12 SITE VISIT FOR REINSPECTIONS

- A. Substantial Completion and Final Completion Inspections: Should Architect have to re-perform site reviews due to failure of Work to comply with claims of completion made by Contractor after second Inspection, Owner will reimburse Architect for such additional services and will deduct amount of compensation from final payment to Contractor.
- B. Contractor's List of Incomplete Items: Should Architect have to re-perform site reviews due to failure of Work to comply with claims of completion made by Contractor after second site review of "Punch List", Owner will reimburse Architect for such additional services and will deduct amount of compensation from final payment to Contractor.

1.13 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
 - 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 - 4. Submit list of incomplete items in the following format:
 - a. PDF Electronic File: Architect will return annotated file.

1.14 SUBMITTAL OF PROJECT WARRANTIES

- A. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on Work that incorporates products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with Contractor.
- B. Owner's Recourse:
 - 1. Written warranties made to Owner are in addition to implied warranties, and shall not limit duties, obligations, rights and remedies otherwise available under law.
 - 2. Warranty periods shall not be interpreted as limitations on time in which Owner can enforce such other duties, obligations, rights, or remedies.
 - 3. Rejection of warranties: Owner reserves right to reject warranties and to limit selections to products with warranties not in conflict with requirements of Contract Documents.
- C. Time of Submittal: Submit electronic files containing warranties, bonds, and maintenance/service contacts within 10 days after date of Substantial Completion.
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit electronic files of documents within 10 days after acceptance listing date of acceptance as beginning of warranty period.
 - 2. For items of Work when acceptance is delayed beyond date of Substantial Completion, submit within 10 days after acceptance listing date of acceptance as beginning of warranty period.
- D. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- E. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit by uploading to web-based project software site.
 - 2. Format: Comply with requirements in Section 017823 "Operation and Maintenance Data."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Refer to Section 018119 - Indoor Air Quality Requirements for prohibited chemical constituents.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - d. Clean glossy materials to polished condition; remove foreign substances.
 - e. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - f. Clean flooring, removing debris, dirt, and staining; clean in accordance with manufacturer's instructions.
 - 1) Refer to individual Specification sections for requirements of sealing, buffing, waxing, and polishing.
 - g. Vacuum and mop concrete.
 - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean in accordance with manufacturer's instructions if visible soil or stains remain.
 - i. Remove labels that are not permanent.
 - j. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - k. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - l. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - m. Clean luminaires, lamps, globes, and reflectors to function with full efficiency. Replace burned-out lamps.
 - n. Clean strainers.
 - o. Prior to final completion, conduct inspection of sight exposed interior surfaces, exterior surfaces, and associated work areas to verify that entire Work is clean.
 - p. Leave Project clean and ready for occupancy.
 - q. Maintain cleaning until Project, or portion thereof, is accepted by Owner.
- C. Construction Waste Disposal: Comply with waste-disposal requirements in Section 015000 "Temporary Facilities and Controls" and Section 017419 "Construction Waste Management and Disposal."

3.2 CORRECTION OF THE WORK

- A. Complete repair and restoration operations required by "Correction of the Work" Article in Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 017700

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record specifications.
 - 3. Record Product Data.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Submit PDF electronic files of annotated PDF files including addenda and Contract modifications.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and Contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of annotated PDF file of the Contract Drawings and each Shop Drawings, incorporating new and revised drawings as modifications are issued.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Format: Annotated PDF electronic file with comment function enabled.
 - a. Provide files in vector format. Raster format PDF's will be accepted only with prior approval from Architect.
 - b. Files shall be rotated, scaled, and cropped to match plotted sheets.
 - 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Use Sheet number and name as bookmark within each PDF file. Include identification in each digital data file.
 - 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation, where installation varies from that indicated in Specifications, addenda, and Contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made including substitutions and product options selected. This is for all product with special emphasis on sustainable products. Mark all sustainable products with identifying notes.
 - 3. Note related Addenda, Supplemental Instruction, Change Orders, Record Drawings, and other issued modifications where applicable.
- B. Format: Submit record specifications as annotated PDF electronic file.
- C. Organize digital data information into separate electronic files that correspond to each specification section of the Contract Manual. Name each file with the specification section number and name. Use specification section number and name as bookmark within each PDF file.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and revisions to Project Record Documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Addenda, Supplemental Instruction, Change Orders, Record Drawings, and other issued modifications where applicable.
- C. Format: Submit Record Product Data as annotated PDF electronic file
 - 1. Include Record Product Data directory organized by Specification Section number and name, electronically linked to each item of Record Product Data.

1.7 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017839

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes:
 - 1. Requirements for Indoor-Emissions-Restricted products.
 - 2. Requirements for VOC-Content-Restricted products.
 - 3. Certification that non-compliant products are not installed on Project.
- B. Related Requirements:
 - 1. Division 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 DEFINITIONS

- A. Indoor-Emissions-Restricted Products: All products in the following product categories:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
 - 3. Flooring.
 - 4. Composite wood.
 - 5. Products making up wall and ceiling assemblies.
 - 6. Interior thermal and acoustical insulation.
 - 7. Free-standing furniture.
 - 8. Exterior applied products (for Healthcare and Schools projects only).
 - 9. Other products when specifically stated in the specifications.
- B. VOC-Content-Restricted Products: All products in the following product categories:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
 - 3. Other products when specifically stated in the specifications.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers; including firestopping sealants and duct joint sealers.
- F. Inherently non-emitting sources: Products that are inherently non-emitting sources of VOCs are considered fully compliant without any VOC emissions testing if they do not include integral organic-based surface coatings, binders, or sealants.
 - 1. Stone.
 - 2. Concrete.
 - 3. Clay brick.
 - 4. Metals that are plated, anodized, or powder-coated.
 - 5. Glass.
 - 6. Ceramics.

7. Solid wood flooring that is unfinished and untreated.

- G. Composite Wood: Products composed of wood or plant particles or fibers bonded by a synthetic resin or binder; including the following:
 1. Particleboard.
 2. Medium-density fiberboard (MDF).
 3. Plywood.
 4. Oriented-strand board (OSB).
 5. Wheatboard.
 6. Strawboard.

1.4 REFERENCE STANDARDS

- A. General: Comply with the applicable provisions of the referenced standards except as modified by governing codes and the Contract Documents. Where a recommendation or suggestion occurs in the referenced standards, such recommendation or suggestion shall be considered mandatory. In the event of conflict of referenced standards and this specification or within the standards themselves, the more stringent standard or requirement shall govern.
 1. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.
 2. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
 3. BIFMA e3 - Furniture Sustainability Standard; Business and Institutional Furniture Manufacturers Association.
 4. BIFMA M7.1 - Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components, and Seating.
 5. CDPH SM – California Department of Public Health Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers, version 1.1-2010 and version 1.2-2017.
 6. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; California Air Resources Board.
 7. CHPS (HPPD) - High Performance Products Database.
 8. CRI (GLP) - Green Label Plus Testing Program - Certified Products.
 9. SCS (CPD) - SCS Certified Products.
 10. UL (GGG) - GREENGUARD Gold Certified Products.
 11. California Dept. of Public Health (CDPH) Standard Method v1.2 2017, Standard Method for The Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers.
 12. California Air Resources Board (CARB) Airborne Toxic Measures to Reduce Formaldehyde Emission from Composite Wood Products Regulation.
 13. CRI – Carpet and Rug Institute Green Label and Green Label Plus Testing Program.
 14. EN 717-1: 2014 Wood-Based Panels – Determination of Formaldehyde Release – Formaldehyde Emission by the Chamber Method.
 15. EPA TSCA Title VI – The Formaldehyde Standards for Composite Wood Products.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. If suitable VOC content required for CALGreen compliance is not met, the Contractor shall calculate VOC's using the "VOC budget process" to demonstrate compliance.

1.6 SUBMITTALS

- A. Product Data: For each VOC-restricted product used in the project submit evidence of compliance in accordance with Section 1.6 below as well as one of the following as pertains to each material category:

1. Material Data Safety Sheet (MSDS) or product data sheets highlighting VOC content measured in grams per liter (g/L) less water and exempt solvents.
 2. A cut sheet, approved third-party certification, test report, or written affidavit from the manufacturer demonstrating compliance with VOC Emissions Evaluation.
 3. Inherently non-emitting materials are considered fully compliant with the Low-Emitting materials credit without any VOC emissions testing if they do not include integral organic based surface coatings, binders, or sealants.
- B. Sustainable Design Reporting: Submit evidence of compliance.
1. Sustainable Product Data Form. See Section 018114 "Product Data Submittal Reporting Form."
 2. Backup Documentation
- C. Installer Certifications Regarding Prohibited Content: Where required by technical Specification, require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either (1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of installer's products, or 2) that such products used comply with these requirements.

1.7 QUALITY ASSURANCE

- A. VOC Emissions Evaluation - Standard and Test Method: CDPH SM v1.1-2010 or v1.2-2017, using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days. Evaluation should report total volatile organic compounds (TVOCs) in ranges: 0.5 mg/m³ or less, between 0.5 and 5 mg/m³, or 5mg/m³ or more.
1. Wet-Applied Products: State amount applied in mass per surface area.
 2. Paints and Coatings: Test tinted products, not just tinting bases.
 3. Evidence of Compliance: Acceptable types of evidence are the following:
 - a. Current UL (GGG) GREENGUARD Gold certification.
 - b. Current SCS (CPD) Floorscore certification.
 - c. Current SCS (CPD) Indoor Advantage Gold certification.
 - d. Current listing in CHPS (HPPD) as a low-emitting product.
 - e. Current CRI (GLP) certification.
 - f. Test report showing compliance and stating exposure scenario used.
 4. Product data submittal showing VOC content is NOT acceptable evidence.
 5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.
- B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements. Laboratories that conduct the tests must be accredited under ISO/IEC 17025 for the test methods they use.
 - b. Published product data showing compliance with requirements.
 - c. Certification by manufacturer that product complies with requirements.
- C. Composite Wood Emissions Standard: CARB (ATCM) for ultra-low emitting formaldehyde (ULEF) resins.
1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Current SCS "No Added Formaldehyde (NAF)" certification; www.scs-certified.com.
 - b. Report of laboratory testing performed in accordance with requirements.
 - c. Published product data showing compliance with requirements.

- D. Furnishings Emissions Standard and Test Method: BIFMA e3 Sections 7.6.1 and 7.6.2, tested in accordance with BIFMA M7.1.
 - 1. Evidence of Compliance:
 - a. Test report showing compliance and stating exposure scenario used.
- E. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.

2.2 ADHESIVES AND SEALANTS

- A. Wet-applied adhesives and sealants installed in the building interior (i.e. inside of the weatherproofing membrane) must comply with the following:
 - 1. VOC Emissions Evaluation, as defined in this Section.
 - 2. VOC Content Evaluation for adhesives and sealants, as defined below:
 - a. Methylene chloride (CAS # 75-09-2) and perchloroethylene (CAS # 127-18-4) may not be intentionally added ingredients.
 - b. Chemical content requirements and maximum VOC content limits established by SCAQMD Rule #1168, October 6, 2017 or July 1, 2005 Amendment and listed later in this Section.
 - 1) VOC limits are defined in grams per liter, less water and less exempt compounds unless otherwise noted.
 - 2) VOC contents are determined by the methods of EPA Reference Test Method 24.

2.3 PAINTS AND COATINGS

- A. Wet-applied paints and coatings installed in the building interior (i.e. inside of the weatherproofing membrane) must comply with the following:
 - 1. VOC Emissions Evaluation, as defined in this Section.
 - 2. VOC Content Evaluation for paints and coatings, as defined below:
 - a. Methylene chloride (CAS # 75-09-2) and perchloroethylene (CAS # 127-18-4) may not be intentionally added ingredients.
 - b. Maximum VOC content limits established by California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule #1113, February 5, 2016 or June 3, 2011 Amendment and listed later in this Section.
 - 1) VOC limits are defined in grams per liter, less water and less exempt compounds unless otherwise noted.
 - 2) VOC contents are determined by the methods of EPA Reference Test Method 24.

2.4 FLOORING SYSTEMS

- A. Carpet systems or assemblies: must meet VOC Emissions Evaluation requirements as defined in this Section.
 - 1. Carpet adhesives must meet the product requirements for Adhesives, as defined in this Section.

- B. Hard and soft surface flooring, wall base, underlayment, and other floor coverings:
 - 1. Flooring products must meet VOC Emissions Evaluation requirements, as defined in this Section. Products which qualify as Inherently Non-emitting Material, as defined in this Section, are exempt from this requirement.
 - 2. Associated site-applied adhesives, grouts, epoxies, mortars, finishes and sealers must meet applicable requirements for Adhesives, Sealants, or Coatings, as defined in this Section.
- C. Site-applied concrete, wood, bamboo and cork floor finishes such as sealer, stain and finish: must meet applicable requirements for Adhesives, Sealants, or Coatings, as defined in this Section.
- D. Tile setting adhesives and grout: must meet applicable requirements for Adhesives, Sealants, or Coatings, as defined in this Section.

2.5 CEILING SYSTEMS

- A. Ceiling systems such as ceiling panels, ceiling tile, surface ceiling structures such as gypsum or plaster, suspended systems (including canopies and clouds), and glazed skylights, must meet VOC Emissions Evaluation requirements as defined in this Section.

2.6 WALL PANELS

- A. Wall panels such as finish wall treatments (wall coverings, wall paneling, wall tile), surface wall structures such as gypsum or plaster, cubicle/curtain/partition walls, trim, doors, frame, windows, and window treatments, must meet VOC Emissions Evaluation requirements as defined in this Section.

2.7 INSULATION

- A. Insulation such as thermal and acoustic boards, batts, rolls, blankets, sound attention fire blankets, foamed-in place, loose-fill and sprayed insulation must meet VOC Emissions Evaluation requirements as defined in this Section.

2.8 COMPOSITE WOOD PRODUCTS

- A. Composite wood products such as particleboard, medium density fiberboard, hardwood veneer plywood, and structural composite wood shall comply with the Formaldehyde Emissions Evaluation, as defined in this Section.

2.9 FURNITURE AND FURNISHINGS

- A. Where required as part of Scope of Work, Furniture and furnishing items purchased and installed for the Project shall meet the Furniture Emissions Evaluation requirements as defined in this Section.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

- B. Additional costs to restore indoor air quality due to installation of non-compliant products shall be borne by Contractor.

3.2 INTERIOR ADHESIVES

A. VOC Limits

1. The volatile organic compound (VOC) content of all field-applied adhesives, adhesive bonding primers, and adhesive primers used on the interior of this Project shall not exceed the limits defined in Rule 1168 - "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California, with a rule amendment date of October 6, 2017 or July 1, 2005.
2. The VOC limits defined by SCAQMD are measured in grams per liter (g/L), less water and less exempt compounds.
3. General: For specified building construction related applications, the allowable VOC content is as follows:
 - a. Architectural Applications:

1) Building Envelope Membrane Adhesive	250
2) Carpet Pad Adhesive	50
3) Ceramic Tile Adhesive	65
4) Cove base adhesive	50
5) Drywall and panel adhesive	50
6) Multipurpose construction adhesive	70
7) Roofing	
a) Single ply roof membrane adhesives	250
b) All other roof adhesives	250
8) Rubber Floor Adhesive	60
9) Structural glazing adhesive	100
10) Structural wood member adhesives	140
11) Subfloor adhesive	50
12) VCT and asphalt tile adhesive	50
13) Wood Flooring Adhesive	100
14) All other indoor floor covering adhesives	50
15) All other outdoor floor covering adhesives	150
 - b. Specialty Applications:

1) Contact Adhesive	80
2) Edge glue adhesive	250
3) All other plastic cement	
a) ABS welding	325
b) ABS to PVC transition cement	510
c) PVC welding	510
d) CPVC welding	490
e) All other plastic welding cements	250
4) Adhesive primer for plastic	550
5) Special Purpose Contact Adhesive	250
6) Adhesive Primer for Traffic Marking Tape	150
7) Structural Wood Member Adhesive	140
8) Top and trim adhesive	250
 - c. Substrate Specific Applications:

1) Metal to metal	30
2) Plastic foams	50
3) Porous material (except wood)	50
4) Wood	30
5) Fiberglass	80
6) Reinforced Plastic Composite	250
 - d. Other

	1) Other adhesives	250
	2) Adhesive bonding primers	250
	3) Adhesive primers, or any other primers	250
e.	Adhesive Primers:	
	1) Plastic	550
	2) Pressure sensitive	785
	3) Traffic marking tape	150
	4) All other adhesive primers	250

3.3 INTERIOR SEALANTS

A. VOC Limits

1. The volatile organic compound (VOC) content of all field-applied adhesives, adhesive bonding primers, and adhesive primers used on the interior of this Project shall not exceed the limits defined in Rule 1168 - "Adhesive and Sealant Applications" of the South Coast Air Quality Management District (SCAQMD), of the State of California, with a rule amendment date of October 6, 2017 or July 1, 2005." The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.
2. General: For specified building construction related applications, the allowable VOC content is as follows:
 - a. Sealants:

1) Clear, Paintable, and Immediately Water-Resistant Sealant	250
2) Foam insulation and sealant	250
3) Grout Sealant	250
4) Non-Staining Plumbing Putty	250
5) Potable Water Sealant	250
6) Single Ply Roof Membrane Sealants	450
7) Other Roof Sealants	300
8) All other Architectural Sealants	250
9) All other Sealants	420
 - b. Sealant Primer:

1) Architectural - Nonporous	250
2) Architectural- Porous	775
3) Modified Bituminous	500
4) Other	750

3.4 INTERIOR ARCHITECTURAL PAINTS

A. VOC Limits

1. The volatile organic compound (VOC) content of all field-applied architectural paints, used on the interior walls and ceilings of this Project shall not exceed the limits defined in the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule #1113, February 5, 2016 or June 3, 2011 Amendment. Product specific requirements are as follows:
 - a. Paints

1) Flat	50
2) Non-Flat	50
3) Non-Flat High Gloss Coatings	150
 - b. Coatings:

1) Aluminum roof coatings	100
2) Bituminous roof primers	350
3) Bond breakers	350

4)	Building envelope coatings	100
5)	Concrete curing compounds	100
6)	Concrete/Masonry Sealers	100
7)	Concrete Surface Retarders	50
8)	Dry fog coatings	50
9)	Faux finishing coatings	
a)	Clear topcoat	100
b)	Decorative coatings	350
c)	Glazes	350
d)	Japan	350
e)	Trowel applied coatings	50
10)	Fire resistive Coatings	150
11)	Floor coatings	50
12)	Form-release compounds	100
13)	Graphic arts coatings (sign paints)	200
14)	High temperature coatings	420
15)	Industrial maintenance coatings	100
a)	Color indicating safety coatings	480
b)	High temperature IM coatings	420
c)	Non-sacrificial anti-graffiti coatings	100
d)	Zinc-rich IM primers	100
16)	Low-Solids Coatings	120
17)	Magnesite cement coatings	450
18)	Mastic texture coatings	100
19)	Metallic pigmented coatings	150
20)	Multi-color coatings	250
21)	Pre-treatment wash primers	420
22)	Primers, Sealers, and Undercoats	100
23)	Reactive penetrating sealers	350
24)	Recycled coatings	250
25)	Roof Coatings	50
26)	Rust Preventative Coatings	100
27)	Sacrificial Anti-Graffiti Coatings	50
28)	Shellacs	
a)	Clear	730
b)	Opaque	550
29)	Specialty primers, sealers, and undercoats	100
30)	Stains	100
31)	Stone Consolidants	450
32)	Swimming Pool Coatings	340
33)	Tile and Stone Sealers	100
34)	Traffic Marking Coatings	100
35)	Tub and Tile refinish Coatings	420
36)	Waterproofing Sealers	100
37)	Wood Coatings	275
38)	Wood Preservatives	350

3.5 INTERIOR COATINGS

A. VOC Limits

1. The volatile organic compound (VOC) content of all field-applied coating used on the interior of this Project shall not exceed the limits defined in California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule #1113, February 5, 2016 or June 3, 2011 Amendment.

2. The VOC limits defined by SCAQMD are measured in grams per liter (g/L), less water and less exempt compounds.
3. If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.
4. General: For specified building construction related applications, the allowable VOC content is as follows:

- a. Coatings

1)	Building Envelope Coatings	100
2)	Clear Wood Finish:	
a)	Varnish	275
b)	Sanding Sealers	275
c)	Lacquer	275
3)	Concrete-Curing Compounds	100
4)	Dry Fog Coatings	50
5)	Floor Coatings	50
6)	Low-solids Coatings	120*
7)	Magnesite Cement Coatings	450
8)	Primers, Sealers and Undercoats	100
9)	Shellac	
a)	Clear	730
b)	Pigmented	550
10)	Stains	100
11)	Waterproofing Sealers	100
12)	Waterproofing Concrete/Masonry Sealers	100
13)	Wood Preservatives	350

*Note: VOC levels for Low-Solids coatings are measured in grams of VOC per liter of material, including water.

END OF SECTION 018116

1.1 GENERAL

1.1 SUMMARY

- A. Description: The Owner has set the following indoor air quality (IAQ) goals for jobsite operations on project, within the limits of the construction schedule, contract sum, and available materials, equipment, products and services. Goals include:
 - 1. Protect workers on the site from undue health risks during construction.
 - 2. Prevent residual problems with indoor air quality in the completed building.
- B. Related Sections:
 - 1. Section 013310 – Submittal Procedures
 - 2. Section 018116 - Low-Emitting Material Restrictions

1.2 REFERENCES

- A. Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings Under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3).
- B. "Construction IAQ Management: Job-site Strategies for Ensuring a Healthy Building," Environmental Building News, Vol. 11, No. 5, May 2002. Good discussion of strategies for controlling airborne pollutants and moisture during construction. Provides checklist based on SMACNA guideline referenced above.

1.3 SUBMITTALS

- A. General: Comply with Sections 013300 requirements.
- B. Indoor Air Quality Management Plan: Prior to beginning work, submit Contractor's indoor air quality management plan to the Architect and Owner for review. The plan shall list the indoor air quality protective measures to be instituted on the site, during the construction and pre-occupancy phases. The IAQ management plan shall comply with the five requirements of SMACNA *IAQ Guideline for Occupied Buildings under Construction, 2nd Edition 2007, Chapter 3*: HVAC protection, source control, pathway interruption, housekeeping, and scheduling and shall include:
 - 1. List of IAQ protective measures to be instituted on the site:
 - a. HVAC system protection during construction.
 - b. Source control through specification and installation of low-toxic or non-toxic materials.
 - c. Pathway interruption to isolate work areas where emitting materials are being installed.
 - d. Housekeeping to protect materials that are stored before installation and to avoid spreading contamination through the Project.
 - e. Sequencing installation of materials to avoid contaminating absorptive materials during construction.
 - f. Moisture protection methods for absorptive materials.

- C. Coordination: Scheduling of finish materials such as woven, fibrous, or porous in nature, including carpets and padding, wallcovering, insulation exposed to air-stream, acoustical ceiling tile, wall fabrics and upholstery, which would tend to absorb chemicals off gassed by composite fabrications, adhesives, sealants, glazing compounds, wall and flooring finishes, etc., as indicated in the individual technical specification sections.
- D. Data Sheets: Provide cut sheets of filtration media used during construction and installed immediately prior to occupancy with MERV values highlighted.

1.4 QUALITY ASSURANCE

- A. Regulated Pollutant Standard: Any pollutant regulated as a primary or secondary outdoor air pollutant shall meet an emission rate standard that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (U.S. EPA, code of Federal Regulations, Title 40, Part 50).
- B. Otherwise Unmentioned Pollutant Standard: Any pollutant not specifically mentioned in regulated pollutant standard, above shall meet an emission rate standard that will not produce an air concentration level greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438) at the anticipated loading in the building within 30 days of installation. (TLV is normally included on product MSDS).

1.2 PART 2 - PRODUCTS

2.1 MATERIALS REQUIREMENTS

- A. General: Low emitting products have been specified in Section 018116 - Low-Emitting Material Restrictions.
- B. Filtration Media: Comply with ASHRAE 52.2-2007 and provided MERV as required.

1.3 PART 3 - EXECUTION

3.1 REQUIREMENTS DURING CONTRUCTION

- A. General: The Contractor is required to meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition, November 2007 to achieve following:
 - 1. Avoid the use of products, materials and operations that could cause problems with IAQ.
 - 2. Protect the ventilation system components (equipment and ductwork) from contamination, and provide cleaning of the ventilation components exposed to contamination during construction. Protect during transit,

and provide protection during job site installation.

3. Provide continuous ventilation rate of 1.5 air changes per hour minimum during construction. Provide additional ventilation as may be necessary to protect worker's health and avoid the accumulation of volatile compounds, dust and other harmful airborne contamination.
 4. Provide a minimum of 85% filtration, or equivalent to minimum efficiency reporting value (MERV) of 8 or better, in any return air systems operational during construction.
- B. During installation of carpet, paints, furnishings, and other VOC emitting products, provide supplemental (spot) ventilation for at least 72 hours after work is completed. Operate HVAC with supply air system only and use exhaust fans to pull exhaust air to avoid contaminating return air ducts.
- C. Conduct regular inspection and maintenance of indoor air quality measures, including ventilation system protection and ventilation rate.
- D. Require VOC safe masks for workers installing VOC emitting products defined as products that emit 150 g/L or more.
- E. Use low-toxic cleaning supplies for surfaces, equipment, and worker's personal use.
- F. When dry sanding for gypsum board assemblies, provide the following protection:
1. Isolate the space under finishing.
 2. Provide plastic protection sheeting separation during the sanding.
 3. Close all air system devices and ductwork.
 4. Sequence construction to avoid contamination of other spaces with gypsum dust.
 5. Provide worker protection.
- G. Use safety meetings, signage, and subcontractor agreements to communicate the goals of the Indoor Air Quality Management Plan.

3.2 VENTILATION SYSTEM PROTECTION:

- A. Do not run HVAC system during course of construction without prior written approval of Owner or as otherwise permitted by these specifications. Seal ductwork intake and exhaust vents to prevent contamination from dust, moisture, and chemical contamination.
- B. Seal HVAC components during installation.
- C. Use a temporary ventilation system during construction.
- D. Use temporary filtration media.
1. Temporary filtration media shall have a Minimum Efficiency Reporting Value MERV of 8 as determined by ASHRAE 52.2-1999 on any return air systems operational during construction. For air intakes into rooms that are very sensitive to dust contamination, such as computer rooms, filtration media should be the best that the HVAC systems fans can han-

dle, up to an MERV rating of 17.

2. Permanent filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13, as determined by ASHRAE 52.5-1999.

E. Clean air plenums before closing them in.

F. Inspect filters regularly.

3.3 MICROBIAL AND FUNGAL CONTAMINATION PREVENTION

- A. Perform, schedule, and sequence Work as required to limit conditions supporting formations of microbes, molds, and fungi

1. Ensure that construction detailing will not result in moisture intrusion.
2. Protect on-site stored and installed absorptive materials (such as insulation, drywall, and wood) from moisture damage and from contamination by construction dust, debris, and fumes during all phases of construction, both before and after installation.
3. Control water penetration, dampness, and humidity to protect products not treated for exterior use.
4. Do not install moisture-damaged materials.

- B. When visible microbial, mold and fungal formations are observed, promptly contact Owner and Architect for determination by industrial hygienist employed by Owner.

1. Clean non-absorbent materials using low hazard cleaners accepted by Owner and Architect.
2. Remove and replace affected materials that cannot be completely cleaned by non-abrasive surface treatments.
3. Remove and replace affected materials identified as being food sources for microbes, molds, and fungi.

- C. Remove interior products and finishes, identified as food sources, that have absorbed sufficient moisture to become damp, and are not immediately made dry, whether or not microbial, mold, or fungal growth is observed. Include:

1. Gypsum board.
2. Organic materials composed of cellulose fiber or paper.
3. Materials containing sucrose or other binders and glues identified as supporting microbial growth.
4. Fibrous insulation materials including duct liner, fiberglass insulation, and mineral fiber.
5. Mechanical ductwork.

- D. Wood Lumber and Engineered Products:

1. Take remedial action to reduce moisture content of wood products measured by a moisture meter as exceeding 15 percent moisture content.

2. Remove wood and cellulose based products showing signs of mildew from construction site, including in-place construction not accepted by Owner's industrial hygienist.
 - E. Promptly correct conditions supporting or subject to become an environment microbial, mold, and fungal growth.
 1. Repair conditions leading to moisture condensation and water penetration.
 2. Do not permit conditions leading to standing water.
- 3.4 POLLUTION SOURCE CONTROL
 - A. Use low-emitting products as specified in Section 018116 - Low-Emitting Material Restrictions.
 - B. Provide strategies to avoid tracking pollutants into the work areas.
 - C. Allow high-VOC materials to off-gas prior to installation. For example, all dry furnishing and materials (such as carpet, floor tile, acoustical tile, textiles, office furniture, wood shelving, etc.) shall be allowed to "air-out" in clean environments prior to installation in a building.
 1. Use the least amount of "wet" materials (such as adhesives, sealants, glazes, caulks, paints, etc.) during construction and product applications while still maintaining installation protocol required to meeting for manufacturer's warranty requirements.
- 3.5 POLLUTANT PATHWAY INTERRUPTION
 - A. Use an air barrier or pressure differential to isolate areas at different stages of completion.
- 3.6 HOUSEKEEPING
 - A. Confine dust-generating activities and promptly clean up dust and other potential airborne contaminants as they are generated.
 - B. Use wet sanding for gypsum board assemblies. Exception: Dry sanding allowed subject to owner approval of the following measures:
 1. Provide full isolation of space under finishing
 2. Install plastic protection sheeting to provide air sealing during sanding operations
 3. Close/seal all air system devices and ductwork
 4. Sequence construction work to prevent contamination of other spaces with gypsum dust
 5. Provide worker protection
 - C. Keep work area dry and promptly clean up all spills.
 - D. Keep containers of volatile liquids covered when not in use.
 - E. Do not allow accumulations of sawdust, dust, rags, debris, and carbon-based materials and materials emitting fumes and odors to accumulate within concealed construction, including within stud spaces and wall cavities. Remove and clean prior to enclosing behind permanent construction.

- F. Vacuum carpet, upholstery, and other porous materials throughout building using a high-efficiency particulate arrestor HEPA filter vacuum cleaner just prior to Substantial Completion. Replace and dispose of vacuum bags when bag is half full.

3.7 SCHEDULING

- A. Account for curing time and off-gassing when scheduling construction activities.
- B. Enclose building, control humidity, ventilate, and make watertight prior to installing interior materials and finishes.
- C. Allow wet-spray cellulose to dry before covering.
- D. Allow furnishings and materials such as carpet, floor tile, acoustical tile, textiles, office furniture, and casework, to air out in clean environment prior to installation.
- E. Install porous materials only after closing in the building.
- F. Allow sufficient time for work generating significant moisture to dry and cure before installing absorbent materials such as carpet, acoustical material, textiles, and other material of type that may attract and retain moisture.
- G. Provide adequate ventilation during curing period.
 - 1. Provide supplemental (spot) ventilation for at least 72 hours after work is completed. Preferred HVAC system operation uses supply air fans and ducts only; exhaust provided through windows. Use exhaust fans to pull exhaust air from deep interior locations. Stair towers and other paths to exterior can be useful during this process.

3.8 REMEDIAL ACTION

- A. Promptly take action as necessary to inspect and remediate conditions suspected of supporting biological, particulate, and chemical indoor air pollution. Identify, stop, and repair causes of uncontrolled water penetration into building.
- B. Promptly notify and consult with Owner and Architect, prior to beginning removal material, where contamination by hazardous chemicals, microbes, and fungi is suspected.

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.
- B. Related Sections:
 - 1. 011000 – Summary: restrictions on use of the premises, Owner-occupancy requirements
 - 2. 017300 – Execution: cutting and patching procedures.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store for reinstallation as part of this project or return to manufacturer for recycling.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 PREINSTALLATION MEETINGS

- A. 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.

1.5 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- B. 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. Ensure Owner's building manager's on-site operations are uninterrupted.
 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 3. Coordination for shutoff, capping, and continuation of utility services.
 4. Use of elevator and stairs.
 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.
- D. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 1. Hazardous materials will be removed by Owner before start of the Work.
 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Refer to Section 011101

- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.9 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- C. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video
 - 1. Inventory and record the condition of items to be removed and salvaged.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. 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.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 3. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

- B. Remove temporary barricades and protections where hazards no longer exist.

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. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain fire watch during and for at least one hour after flame-cutting operations.
 - 6. Maintain adequate ventilation when using cutting torches.
 - 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 10. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to Owner's storage area designated by Owner
 - 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.
 - 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Metal foam wall panels: Existing material is brittle with sharp edges. Special care required in handling and cutting.
- B. Carpet Tile: Contact product representative for coordination with manufacturer's recycling program. Include demolished carpet tile and Owner's attic stock. Refer to Section 096813 and Finish Schedule for additional information.
- C. Wall Covering at existing operable partition: Contact Carnegie Fabrics for recycling of existing Xorel fabric.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

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.

END OF SECTION 024119

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes Decorative Metals:
 - 1. **(DECO MTL-01)** Bent aluminum plate
 - 2. **(DECO MTL-02)** Custom solid steel plate corner guards.
- B. Related Sections:
 - 1. 099000 – Painting and Coatings

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated, including finishing materials.
- B. Shop Drawings: Show fabrication and installation details for decorative metal.
 - 1. Include plans, elevations, component details, and attachments to other work.
 - 2. Indicate materials and profiles of each decorative metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.
- C. Samples for Initial Selection: For products involving selection of color, texture, or design
- D. Samples for Verification: For each type of exposed finish required.
 - 1. Provide (2) 12" long samples of each decorative metal with specified finish in selected color.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing decorative metal similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Installer Qualifications: Fabricator of products.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
 - 4. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store decorative metal in a well-ventilated area, away from uncured concrete and masonry, and protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity.
- B. Deliver and store cast-metal products in wooden crates surrounded by sufficient packing material to ensure that products will not be cracked or otherwise damaged.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with decorative metal by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION

- A. Coordinate installation of anchorages for decorative metal items. 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.

PART 2 - PRODUCTS

2.1 DECORATIVE METAL PANELS

- A. Refer to drawings for locations, configurations, material thickness and finish

2.4 FASTENERS

- A. Fastener Materials: Unless otherwise indicated, provide the following:
 - 1. Uncoated-Steel Items: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed, Type 304 stainless-steel fasteners where exposed.
 - 2. Dissimilar Metals: Type 304 stainless-steel fasteners.
 - 3. Counter sunk square drive fasteners, finish to match metal surface
- B. Fasteners for Anchoring to Other Construction: Unless otherwise indicated, select fasteners of type, grade, and class required to produce connections suitable for anchoring indicated items to other types of construction indicated.
- C. Provide concealed fasteners for interconnecting components and for attaching decorative metal screen to other work unless otherwise indicated.
- D. Anchors, General: 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.

2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.6 FABRICATION, GENERAL

- A. Assemble items 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.

- B. Form decorative metal to required shapes and sizes, true to line and level with true curves and accurate angles and surfaces. Finish exposed surfaces to smooth, sharp, well-defined lines and arris.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Mill joints to a tight, hairline fit. Cope or miter corner joints. Fabricate connections that will be exposed to weather in a manner to exclude water.
- E. Provide necessary rebates, lugs, and brackets to assemble units and to attach to other work. Cut, reinforce, drill, and tap as needed to receive finish hardware, screws, and similar items unless otherwise indicated.
- F. Comply with AWS for recommended practices in shop welding. Weld behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded joints of flux, and dress exposed and contact surfaces.

2.7 DECORATIVE METAL PANELS

- A. General: Fabricate decorative metal panels to designs indicated from steel tubes, bars and shapes of sizes and profiles indicated.
- B. Brackets, Fittings, and Anchors: Provide wall brackets, fittings, and anchors to connect decorative metal panels to other work unless otherwise indicated.
 - 1. Furnish inserts and other anchorage devices to connect decorative panels to concrete and structure above. Coordinate anchorage devices with supporting structure.
 - 2. Fabricate anchorage devices that are capable of withstanding loads indicated.

2.8 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of decorative metal.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Provide anchorage devices and fasteners where needed to secure decorative metal to in-place construction.

- B. Set products accurately in location, alignment, and elevation, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items to be built into concrete, masonry, or similar construction.
- C. Fit exposed connections accurately together to form tight, hairline joints or, where indicated, uniform reveals and spaces for sealants and joint fillers. Where cutting, welding, and grinding are required for proper shop fitting and jointing of decorative metal, restore finishes to eliminate evidence of such corrective work.
- D. Do not cut or abrade finishes that cannot be completely restored in the field. Return items with such finishes to the shop for required alterations, followed by complete refinishing, or provide new units as required.
- E. Install concealed gaskets, joint fillers, insulation, and flashings as work progresses.
- F. Restore protective coverings that have been damaged during shipment or installation. Remove protective coverings only when there is no possibility of damage from other work yet to be performed at same location.
 - 1. Retain protective coverings intact; remove coverings simultaneously from similarly finished items to preclude non-uniform oxidation and discoloration.

3.3 CLEANING AND PROTECTION

- A. Unless otherwise indicated, clean metals by washing thoroughly with clean water and soap, rinsing with clean water, and drying with soft cloths.
- B. Protect finishes of decorative metal from damage during construction period with temporary protective coverings approved by decorative metal fabricator. Remove protective covering at time of Substantial Completion.
- C. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 057000

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. High-pressure decorative laminate for interior applications (**PLAM-##**).
- B. Related Requirements:
 - 1. Section 062023 Interior Finish Carpentry
 - 2. Section 081416 Flush Wood Doors

1.2 REFERENCE STANDARDS

- A. ANSI A208.1 – Particleboard.
- B. ANSI A208.2 – Medium Density Fiberboard (MDF) for Interior Applications.
- C. ANSI/NEMA LD 3 – High-Pressure Decorative Laminates.
- D. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- E. AWI Architectural Woodwork Standards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. manufacturer's product data, including inspection, preparation, fabrication, and installation instructions.
 - 2. Samples: Submit manufacturer's samples of each pattern, grade, and finish of high-pressure decorative laminate specified. Minimum 5 inches x 8 inches
 - 3. Maintenance Instructions: Submit manufacturer's maintenance instructions.
 - 4. Warranty Documentation: Submit manufacturer's standard warranty.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer regularly engaged, for past 10 years, in manufacture of high-pressure decorative laminate of similar type to that specified.
- B. Fabricator/Installer's Qualifications:
 - 1. Fabricator/installer regularly engaged, for past 5 years, in fabrication and installation of high-pressure decorative laminate of similar type to that specified.
 - 2. Employ people trained for fabrication and installation of high-pressure decorative laminate.
 - 3. Material Source: Obtain high-pressure decorative laminate materials through single source from single manufacturer

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage and Handling Requirements:

1. Store and handle materials in accordance with manufacturer's instructions.
2. Keep materials in manufacturer's original, unopened containers and packaging until fabrication and installation.
3. Store materials in clean, dry area indoors.
4. Store materials out of direct sunlight.
5. Keep materials from freezing.
6. Store high-pressure decorative laminate horizontally with top face-down and caul board placed on top to protect laminate from damage and warping.
7. Store high-pressure decorative laminate and substrates at 75 degrees F (24 degrees C) and 45 percent to 55 percent relative humidity.
8. Protect high-pressure decorative laminate from moisture and from contact with floors and exterior walls.
9. Protect corners of high-pressure decorative laminate from damage.
10. Protect materials during storage, handling, fabrication, and installation to prevent damage.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations:

2.2 MATERIALS

- A. Laminated Plastic (**PLAM-##**): High pressure decorative laminate (HPDL), conforming to NEMA LD-3; provide the types, colors and finishes as described in the Finish Legend in the drawings.
- B. Manufacturing Process:
1. Laminate phenolic resin-impregnated kraft sheets with melamine resin-impregnated decorative and overlay sheets.
 2. Perform lamination under a minimum pressure of 1,000 psi (6,895 kPa) and at a temperature of approximately 300 degrees F (149 degrees C).
 3. Sand pressed laminate to provide uniform thickness and to facilitate adhesive bonding.
 4. Contains no added urea-formaldehyde.
- C. Types:
1. Standard Grade type GP48, nominal 0.048 inch thick; minimum 11 percent post-consumer recycled content.
Refer to Finish Legend sheets in the drawing set for individual technom designations and specific information about finish materials such as color, model, dimension and manufacturer

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine surfaces for conditions that could adversely affect the performance of the decorative plastic laminate installation, including edge performance.
- B. Surfaces to be adhesively bonded shall be clean, dry and free of any dust, loose paint, wax, moisture, dirt, grease, oil, rust, or other contaminants.

- C. Commencement of work will constitute acceptance of existing conditions and surfaces to receive the work.

3.2 INSTALLATION

- A. Install materials according to referenced Specification Sections and the following conformance standards as applicable:
 - 1. AWI AWS.
 - 2. KCMA A161.1.
- B. To avoid stress cracking, do not use square-cut inside corners. All inside corners to have a minimum 1/8 inch radius and all edges routed smooth.
- C. Drill oversized holes for screws, bolts, and similar fasteners. Slightly countersink fasteners into face side of laminate-clad substrate.
- D. Use carbide-tipped saw and router blades for cutting, with high tool speed and low feed speed. Keep cutting blades sharp. Use appropriate hold-downs to prevent vibration.

3.3 CLEANING

- A. Clean decorative plastic laminate according to manufacturer's printed care and maintenance instructions.
- B. Protect installed products and finish surfaces from damage during remainder of construction period.

END OF SECTION 064216

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Finish carpentry work includes, but is not limited to, the following:
 - 1. Wood wall panels, and labor and materials as required to furnish and install wood wall panels (**MDFP-##**) with metal furring and sub-framing.
 - 2. Solid wood base shown as (**WB-01**)
 - 3. MDF Base (**MDFB-01**)
- B. Related Sections:
 - 1. 018119 – Indoor Air Quality (IAQ) Requirements
 - 3. 099000 – Painting and Coating: Painting and stains.
- C. Back Priming: Prior to installation, prime or seal back side of MDF trim members with primer as specified in Section 099000 – Painting and Coatings.
- D. Substitutions: Substitute products will be considered only under terms and conditions specified in Section 012500 – Substitution Procedures.

1.2 REFERENCES

- A. American Society for Testing & Materials (ASTM): E84 - Test for Surface Burning Characteristics of Building Materials.
- B. West Coast Lumber Inspection Bureau (WCLIB): No. 16 - Standard Grading Rules for West Coast Lumber.
- C. American National Standards Institute (ANSI): A208.2 - Medium Density Fiberboard (MDF).
- D. American Wood Preservers' Association (AWPA): C2 - Lumber, Timbers, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes.
- E. American Wood Preservers Bureau (AWPB): LP-2 - Standard for Softwood Lumber, Timber and Plywood Pressure Treated with Water-Borne Preservatives for Above Ground Use.

1.3 SUBMITTALS

- A. General: Make submittals in accordance with Section 013300 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data on the following:
 - 1. Medium density fiberboard (MDF).
- C. Shop Drawings: Show sub-framing spacing and member type, panel layout, fastener spacing, flashing locations, corner and transition details
- D. Samples for Initial selection: For each type of product involving selection of colors, profiles, or textures.

E. Samples for Verification:

1. For each species and cut of lumber and panel products with nonfactory-applied finish, with half of exposed surface finished; 50 sq. in. for lumber and 8 by 10 inches for panels.

F. Material Certificates - Fire Retardant Treatment: Submit certification by treating plant stating chemicals and process used, net amount of preservative retained and conformance with applicable standards.

1.4 QUALITY ASSURANCE

- A. Lumber Standards: Comply with PS 20 and with applicable rules of the respective grading and inspecting agencies for species and products indicated.

1.5 DELIVERY, STORAGE & HANDLING

- A. General: Comply with requirements specified in Section 016000 - Product Requirements.
- B. Delivery: Deliver treated materials bundled and marked to identify treatment.
- C. Storage: Store treated materials for easy identification and protect from moisture; provide well-ventilated dry storage.
1. Store panels horizontally with supports no more than 31-1/2 (80 mm) inches apart.
 2. Store panels in clean dry location protected from rain and sun within manufacturer's recommended temperature and humidity range

1.6 WARRANTY

- A. Provide manufacturer's standard 10-year warranty covering structural stability, color and finish retention for panels installed within 10 degrees of vertical

PART 2 - PRODUCTS

2.1 WOOD PANELING, STANDING AND RUNNING TRIM

- A. Refer to drawings for individual technom designations and specific information about finish materials such as color, model, dimension and manufacturer
- B. Accessories:
1. Wall Adhesive: Multi-purpose construction, low VOC cartridge type, compatible with substrate, capable of achieving durable bond and meeting VOC criteria per Section 018116 Low-Emitting Materials Restrictions.
 2. Panel Hanging Cleats: Brooklyn Hardware Manufacturing, Inc. "Panelclip", Monarch "Z-Clip" or similar interlocking extruded aluminum concealed cleats.
 3. Sub-framing system:
 - a. Provide metal stud blocking as indicated

PART 3 - EXECUTION

3.1 PREPARATION

- A. Conditioning: Do not install finish materials until spaces are enclosed and at approximate humidity condition planned for occupancy. Condition wood for 5 days before start of installation by placing in spaces to receive finished installation and maintaining ambient temperature between 65 and 75 deg F before, during, and after installation.

3.2 INSTALLATION

- A. General: Carefully cut, lay out and fit carpentry work indicated on drawings and specified hereinafter; use sufficient fasteners to insure permanent attachment. Anchor paneling to supporting substrate with concealed panel-hanger clips or with adhesive. Do not use face fastening unless otherwise indicated. Where exposed fasteners are indicated in drawings, drive fasteners through pre-drilled and countersunk holes, evenly spaced directly to framing or nailer location. Install all work in accurate locations to true lines, plumb and level. Attach at interval not to exceed 24 inches on center.
- B. Blocking & Bracing: Provide rough lumber members in sizes as noted on drawings or as required for the conditions of the installation.
- C. Nailers & Sleepers: Provide rough lumber members, from nominal 2-inch stock. Install to true lines in accurate locations and elevations for attachment of other materials as indicated on drawings.
- D. Shims: Provide rough lumber members formed and shaped for tight wedge fit where required for installation of materials or equipment in proper alignment, level, and plumbness.
- E. Wood Base and Trim: Install with minimum number of joints, using full-length pieces to greatest extent possible.
 - 1. Stagger joints in adjacent and related members; use scarf type joints at all locations. Cope at returns and miter outside and inside corners. Scribe base at bottom edge to fit flush at hard surface floor areas.
 - 2. Secure base and trim through face at each stud location with countersunk screws. For stained and clear coated wood species, use matching wood plugs and sand / finish in place.

3.3 PROTECTION

- A. Provide protection and maintain conditions in a manner that ensures that installed work is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 062023

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide firestopping and smoke seals in the following areas, including:
 - 1. Penetrations in floors and fire-rated wall assemblies, both empty and those accommodating penetrating items such as cables, cable trays, conduits, pipes, ducts, etc.
- B. Responsibility: This Section contains requirements for firestopping and smoke barrier penetration seals around pipes, ducts, conduits, etc., in walls, partitions, ceilings and floors. The installers of Work under Divisions 21 through 26 of this Contract shall be responsible for providing required sleeves and for sealing said penetrations in accordance with requirements of this Section.
- C. Related Section:
 - 1. 013100 – Project Management and Coordination: Coordination for pre-installation conference.
- D. Substitutions: Substitute products will be considered only under terms and conditions specified in Section 012500 Substitution Procedures.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated and the passage of smoke and other gases, and maintain original fire-resistive rating of assemblies in which the fire-resistive joint system is installed.
- B. Penetrations:
 - 1. Firestop system is defined as the combination of materials, including the penetrating items, required to make a complete firestop, including sleeves and backing materials that comply with code authority requirements for 'Through Penetrations' and 'Membrane Penetrations'.
 - 2. Provide firestop assemblies that have been tested in accordance with ASTM E814 or UL 1479 with a minimum positive pressure differential of 0.01 inch (2.49 Pa).
 - 3. Firestop materials must be labeled or listed by Underwriters Laboratories, Inc., or Warnock Hersey International, Inc. and shall have been tested in an approved fire- resistance-rated assembly.
- C. Wall Penetrations Requirements:
 - 1. Through Penetration Firestop Systems: Comply with CBC 2019 Section 714.4.1.2 through-penetration firestop system with an F-rating of not less than the required fire-resistance rating of the wall penetrated.
 - 2. Membrane Penetration: Comply with CBC 2019 Section 714.4.2 where wall and partitions are required to have a minimum 1-hour fire-resistive rating, recessed fixtures shall be installed that do not reduce the fire-resistance of the assembly.

- D. Horizontal Penetration Requirements: Comply with Section 714.5 for Horizontal Assemblies as follows:
 - 1. Through Penetration Firestopping Systems: Comply with CBC 2019 Section 714.5.1.2 with F-rating and a T-rating of not less than 1-hour, but not less than the required rating of the floor penetrated.
 - 2. Membrane Penetration: Comply with CBC 2019 Section 714.5.2 where floor/ceiling are required to have a minimum 1-hour fire-resistive rating, recessed fixtures shall be installed that do not reduce the fire-resistance of the assembly.
- E. Special Conditions:
 - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestops systems.
 - 2. For floor penetrations with annular spaces exceeding 4 inches or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.
 - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
 - 4. For firestopping exposed to view, provide products with flame spread of 25 or less and smoke development of 450 or less when tested per ASTM E84.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
 - 1. Types of penetrating items.
 - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
 - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.
- D. Qualification Data: For Installer.
- E. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

1.4 QUALITY ASSURANCE

- A. Material Qualifications and Fire Ratings: Provide only materials tested and certified to conform with specified requirements.

1. Fire ratings for firestopping and smoke seal assemblies must be a minimum of one (1) hour, but not less than the fire resistance rating of the assembly being penetrated.
 2. Fire ratings for fire-resistant joints assemblies shall not be less than the wall /floor assembly as indicated.
- B. Single Source: Obtain materials for each fire rated assembly, for each kind from a single manufacturer.
- C. Installer's Qualifications: Engaged an experienced Installer who has completed firestopping that is similar in material, design, and extent to that indicated for Project and that has performed successfully.
- D. Un-Tested Penetrations: For mechanical and electrical penetrations which have characteristics (e.g. pipe material and diameter, pipe insulation type and thickness, type of wall that is penetrated) that have not been tested in accordance with ASTM E814 or UL 1479 by any firestopping manufacturer, provide a written judgment from the proposed firestopping manufacturer stating that the manufacturer's firestopping material will meet the requirements for successfully passing the tests in ASTM E814 or UL 1479.
1. The written judgment shall contain firestopping installation procedures (e.g. sleeve material and size, space requirements, quantity of firestopping material required).
 2. If required, submit written judgments to the local building code authorities and obtain their approval before submitting to Architect for their review.
- E. Un-Tested Fire-Resistive Joint Assemblies: For wall/ floor fire-resistive assemblies which require modifications to satisfy the Performance Requirements above, provide assemblies which are based on a UL tested assembly and are approved by the authority having jurisdiction (AHJ) for each assembly for the named work. Fire-resistive joint assemblies based on previous projects using similar curtain wall assemblies will not be accepted for approval.
- F. Pre-Installation Conference: Conduct pre-installation conference in accordance with Section 013100 - Project Management and Coordination. Conference shall be attended by firestopping and smoke seal installer, materials representatives, mechanical, electrical, and data subcontractors, and special inspector.
1. Agenda: Include discussion and agreement upon acceptable:
 - a. Product listings and classification schedule.
 - b. Test firestop materials to confirm compatibility with adjacent materials and chemicals and solvents with which they may come into contact during construction.
 - c. Review scheduling and sequencing for each type of penetration.
 - d. Review potential conflicts between existing conditions and installation requirements.
 - e. Review inspection procedures and methods for correcting deficiencies.
- G. Special Inspections: Refer to article entitled "Field Quality Control" of this Section for special inspection which may be performed by Owner's inspection agency.
- 1.5 DELIVERY, STORAGE AND HANDLING
- A. General: Comply with requirements specified in Section 016000 Product Requirements.
- B. Deliver materials undamaged in manufacturer's unopened containers or packages identified with brand, type, grade, and UL label. Coordinate delivery with scheduled installation date to minimize storage time at site. Leave seals unbroken and labels intact until time of use.

Remove from job site rejected or damaged packages found unsuitable for use. Store materials in clean, dry, ventilated location. Follow manufacturer's instructions.

1.6 PROJECT CONDITIONS

- A. General: Conform to manufacturer's printed instructions for installation and, when applicable, curing recommendations regarding temperature and humidity. Provide adequate ventilation if using solvent. Provide forced air ventilation during installation, if required by manufacturer. Keep flammable materials away from sparks or flame.
- B. Coordination with Other Trades: Coordinate annular space, sleeve and insulation requirements with work of Divisions 22, 23, 23 and 26. Firestopping or smoke seal material at penetrations of insulated pipes shall be applied after the insulation is installed. The material selected for use with insulated pipes shall have been tested in accordance with ASTM E814 or UL 1479 for that particular insulated pipe assembly.

1.7 SEQUENCING AND SCHEDULING

- A. Sequence Work properly with adjacent work to allow unobstructed access to all areas needing firestops and smoke seals.
 - 1. Identify penetrations and openings requiring firestops, smoke seals, fire containments, and construction joints.
 - 2. Schedule installation of firestopping after completion of work involving penetrating items, but prior to covering, concealing, and eliminating access to penetrations.
 - 3. Coordinate with work of other trades
- B. Inspection: Request inspection of firestops by authority having jurisdiction and testing consultant before concealment.
 - 1. Sequence work to permit installation to be inspected and approved prior to being concealed.
 - 2. Ensure that subsequent openings and penetrations are reported, properly firestopped, and inspected.
 - 3. Notify Owner's inspection agency at least 5 days in advance of firestopping installations; confirm dates and times on days preceding each series of installations. Do not cover up those firestopping installations that will become concealed behind other construction until Owner's inspection agency and authorities having jurisdiction have examined each installation.

PART 2 - PRODUCTS

2.1 FIRESTOPPING AND SMOKE SEALS FOR WALL / FLOOR PENETRATIONS

- A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and applications, as demonstrated by firestopping manufacturer based on testing and field experience.
- B. Firestopping and smoke seal materials: Asbestos free, complying with system Part 1 "Performance Requirements" Article. Firestop materials shall not emit hazardous, combustible or irritating fumes during installation, curing or use. Use only components tested by the

firestopping manufacturer and approved by the qualified testing and inspecting agency for systems and as approved by the AHJ.

- C. Manufacturers: It is the responsibility of the trade subcontractor to select the appropriate firestop system for type of penetration and construction indicated.
- D. Acceptable Manufacturers:
 - 1. Hilti, Corp., Tulsa, OK.
 - 2. 3M Fire Protection Products, St. Paul, MN.
 - 3. Specified Technologies Inc., Somerville, NJ.
 - 4. Tremco Inc., Cleveland, OH.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of respective manufacturer. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping. Remove laitance and form release agents from concrete.
- B. Priming: Prime substrates where recommended by firestopping and smoke seal manufacturer using respective manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Mask where necessary to protect adjoining surfaces. Remove excess material and stains on surfaces as required.

3.2 INSTALLATION FOR PENETRATIONS

- A. General: Comply with the article entitled "Performance Requirements" of this Section and the respective through-penetration firestopping manufacturer's installation instructions and drawings pertaining to products and applications indicated. Provide firestopping material in the following locations:
 - 1. Mechanical and electrical penetrations (e.g. insulated and non-insulated pipe, tubing, wiring, raceways, cable and conduit penetrations, cable trays, busways, and ductwork without fire or smoke-fire dampers) through floor slabs and through time rated partitions, ceilings, fire walls and smoke walls.
 - 2. Unused openings in floor slabs and time-rated partitions and walls.
 - 3. Other locations indicated, specified or required by codes or local authorities.
- B. Accessories: Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
- C. Installation: Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:

1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.
2. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.3 CLEAN-UP

- A. After completion of application of firestopping or smoke seal materials, remove debris, excess materials, and broom clean exposed wall and floor areas. Neatly cut and trim materials as required.
- B. When finished work will be visible, remove temporary dams and clean adjacent surfaces in accordance with manufacturer's printed instructions. Remedy staining and discoloration on adjacent surfaces caused by work under this Section.

3.4 FIELD QUALITY CONTROL

- A. General: Inspection agency, employed and paid by Owner, and conforming with ASTM E2174 "Standard Practice for On-Site Inspection of Installed Fire Stops", will examine completed firestopping to certify compliance with specified requirements. Where deficiencies are found, repair or replace firestopping so that it complies with requirements.
- B. Maintain accessibility to all areas of work until completion of inspection by the Building Official or authority having jurisdiction, in accordance with CBC Article 110.3.7, as required.
- C. Testing Services: Inspecting of completed installations of fire-resistive joint systems shall take place in successive stages as installation of fire-resistive joint systems proceeds. Do not proceed with installation of joint systems for the next area until inspecting agency determines completed work shows compliance with requirements.
 1. Inspecting agency shall state in each report whether inspected fire-resistive joint systems comply with or deviate from requirements.
- D. Remove and replace fire-resistive joint systems where inspections indicate that they do not comply with specified requirements.
- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- F. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and fire-resistive joint systems comply with requirements.

END OF SECTION 078413

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes: Provide sealant and backing materials for sealing of joints in construction. In general, this includes, but not limited to, the following:
 - 1. Perimeter joints between materials adjacent to door frames, aluminum windows and curtainwall, louvers, etc.
 - 2. Horizontal expansion joints.
 - 3. All locations noted on drawings as "sealant" or "caulking".
 - 4. Tape for isolation and gasketing as indicated.
- B. Related Sections:
 - 1. Section 018119 "Indoor Air Quality (IAQ) Requirements"
 - 2. Section 092900 "Gypsum Board" for acoustic sealant for sound rated, insulated partitions.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each joint sealer product required, including instructions for joint preparation, primer (if required), and recommended back-up material. Include special requirements which pertain to sand texturing of exterior sealants.
- B. Joint Sealant Schedule: Provide a list of areas/locations and substrates to which each product submitted according with Sealant Schedule in this Section. Include:
 - 1. Joint-sealant manufacturer and product name.
 - 2. Joint-sealant formulation.
 - 3. Joint-sealant color.
- C. Samples for Initial Selection: Submit initial color samples in the form of manufacturer's bead samples consisting of strips of actual products showing full range of colors available for each product.

1.4 INFORMATIONAL SUBMITTALS

- A. Certification: Submit written certification from sealant manufacturer stating that materials forming joint substrates and joint backings (e.g. concrete, fluoropolymer coatings) have been tested for compatibility and adhesion with proposed joint sealants and are suitable for the use intended as specified.
- B. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- C. Field Quality-Control Reports: For field-adhesion-test reports, for each sealant application tested.

1.5 CLOSE-OUT SUBMITTALS

- A. Manufacturers' special warranties.
- B. Installer's special warranties.

1.6 QUALITY ASSURANCE

- A. Installer's Qualifications: Engage experienced Installers who have completed joint sealant applications similar in material, design, and extent to that indicated for Project.

1.7 DELIVERY, HANDLING & STORAGE

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multi-component materials.
- B. Store and handle in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.8 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 - 1. Ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 degrees F.
 - 2. Joint substrates are wet due to rain, condensation or other causes.
 - 3. Joint Width Conditions: Do not proceed with installation of joint sealant when joint widths are less than allowed by joint sealant manufacturer for application indicated.
 - 4. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty periods from date of Substantial Completion: Installation: 5 years
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty periods from date of Substantial Completion:
 - a. Silicone sealants: 20 years
 - b. Polyurethane sealants: 5 years
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.

4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Single Source Responsibility: Obtain joint sealant materials for each application from a single manufacturer. Obtain exterior joint sealants between architectural precast concrete and face brick from one manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Indoor Environment Quality: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to the VOC Criteria in Section 018113.:
 1. Sealants: Section 018116 "Low-Emitting Material Restrictions."
 2. Sealant Primers for Porous and Nonporous Substrates: Section 018116 "Low-Emitting Material Restrictions."

2.3 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Sealants (**Type "C"**) used in horizontal applications shall match adjacent material color tone.

2.4 SEALANT TYPES AND MANUFACTURERS

- A. **Type "A" Sealant:** one-part, low-modulus silicone elastomeric sealant meeting requirements of ASTM C920, Type S, Grade NS, Class 25; Dow Corning "795 Building Sealant"; General Electric "SilPruf SCS2000"; Tremco "Spectrum 2"; or accepted substitute.
 1. Application: Exposed exterior joints not subject to foot or vehicle traffic.
- B. **Type "B" Sealant:** Self-leveling 2-part urethane meeting requirements of ASTM C920, Type M, Grade P, Class 25; MasterSeal SL 2; Sikaflex 2c NS.
 1. Application: Interior joints subject to foot or vehicle traffic.
- C. **Type "C" Sealant:** Silyl-terminated polyether elastomeric sealant conforming with requirements of ASTM C920, Type M, Grade P, Class 25. Sonneborne "Sonolastic 150", Henry Company "HE925 - BES Sealant" or approved.
 1. Applications: Metal to metal open joints, either back groove or top of surface mounted flashing, exposed to weather, and for bedding thresholds and break formed flashings.
 2. Sealant used in conjunction with WAB, roof membrane edges, and similar weatherproofing applications where silicone sealant is not compatible with one or both materials to be sealed.
- D. **Type "D" Sealant:** one part acrylic latex sealant complying with requirements of ASTM C834 Geocel "834"; Pecora Chemical Corporation "AC-20 Acrylic Latex"; Sonneborn "Sonolac"; Tremco "Tremflex 834"; Sherwin-Williams "Pro Select 850A", or accepted substitute.
 1. Applications: Interior joints not subject to traffic, except in wet areas.

- E. **Type "E" Sealant:** one part mildew resistant silicone sealant complying with requirements of ASTM C920, Type S, Grade NS, Class 25; Dow Corning "786 Mildew Resistant Silicone"; General Electric "SCS1702"; Pecora Corporation "898 Sanitary Mildew Resistant Silicone Sealant", Tremco, Inc "Tremsil 200" or accepted substitute.
1. Applications: Interior joints in a wet areas (perimeter of countertops with sinks)
- F. **Type "F Series" Sealants:** Non-curing, non-hardening, synthetic rubber sealer, recommended for use by manufacturer for concealed locations joint is where subject to changes in temperature, water and vibration.
1. **Type "F-1":** Tape consistency, solvent-free, butyl-based sealant with a solids content of 100%; meeting the requirements of AAMA 804.1-85 (as described in AAMA 800). Packaged in rolls with release paper backing.
 - a. Acceptable products include:
 - 1) Tremco "440 Tape".
 - 2) Pecora, "Extru-Seal".
 - 3) PTI "606 Architectural Sealant Tape".
 - b. Applications: Metal to metal, and dissimilar materials, compression joints subject to shear.
 2. **Type "F-2":** Mastic consistency, one-part non-drying, non-hardening, non-bleeding and permanently resilient butyl sealant, meeting or exceeding AAMA809.2.
 - a. Acceptable products include:
 - 1) Bostik 5612
 - 2) Pecora, "BR-96".
 - 3) Tremco "JS-773 Sealant".
 - b. Applications: Metal to metal laps, concealed compression joints.
 3. **Type "F-3":** One part, moisture curing urethane.
 - a. Acceptable products include:
 - 1) MasterSeal NP 1
 - 2) Sika, "Sikaflex 1a"
 - b. Metal to metal open joints, either back groove or top of surface mounted flashing, exposed to weather, and for bedding thresholds and break formed flashings.

2.5 ACOUSTICAL SEALANT

- A. **Acoustical Sealant (Type "J"):** One-part, resilient and non-setting. Spray-on sealants are not acceptable.
1. Fire Rated Partitions - acceptable products: CP 25 Caulk by 3M Corporation, Acoustical Sealant by Specified Technologies, or approved
 2. Other applications - acceptable products: Acoustical Sealant by U.S. Gypsum, AC20®FTR Acoustical Sealant by Pecora Chemical Corporation, Acoustical Caulking CC-75 by Mason Industries, or approved

2.6 JOINT SEALANT BACKING

- A. PVC Tape (**Type "G"**): Norton Norseal V740, or approved equal black PVC with self-adhesive backing; 1/8 inch thickness by 1/2 inch, nominal width, unless noted otherwise.
1. Typical application: Gasket/sealant to reduce air movement, acoustical and vibration isolation and between dissimilar materials and elsewhere indicated.
- B. Expanding Foam Tape (**Type "H"**): Sandell Mfg. Co. Inn., "Polyseal", Bosig "Wintape Expand 600", or approved equal, self-expanding polyurethane foam impregnated with modified acrylic flame retarding polymer meeting UL 94 HF-1 (Self-Extinguishing).
1. Typical application: For cold joints on exterior envelope components, interior side of window to WAB.

- C. Plastic Foam Backer Rod: Preformed compressible, resilient, non-waxing, non-extruding foam, of size, shape and density to suit various conditions and control sealant depth. Provide open or closed cell as recommended by sealant manufacturer.
 - 1. Backer rod type recommended for compatible with sealant by sealant manufacturer, and of type which does not cause staining or discoloration of joint based on field experience and laboratory testing.
 - 2. Sizes as recommended by sealant manufacturer, with diameter never less than 30 percent greater than width of joint.
- D. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and back surface of joint. Provide self-adhesive tape wherever applicable.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.
- B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials, which are not harmful to substrates and adjacent nonporous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Cleaning of Joints: Clean joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:
- B. Remove lacquers and protective films from metal surfaces. Clean metal, glass, and other nonporous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealants.
- C. Jointing Priming: Prime joint substrates where recommended by joint sealer manufacturer based on preconstruction compatibility and adhesion testing or prior experience. Apply primer undiluted in uniform coating over surface. Confine primers to areas of joint sealer bond; do not allow spillage or migration onto adjoining surfaces.
- D. Masking Tape: Apply masking tape around joints where required to prevent contact of sealant with adjoining surfaces which otherwise would be 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 SEALANT

- A. General: Comply with joint sealer manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Installation Standards: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Installation of Sealant Backings:
 - 1. Install backer rods in all butt type joints receiving sealant where depth of joint exceeds manufacturer's recommendations. Install joint filler using a blunt tool or plain faced roller. Do not puncture, stretch, or twist joint fillers.
 - 2. Do not leave gaps between ends of joint fillers. Remove joint fillers that become wet prior to sealant application and replace with dry material.
 - 3. Generally, install joint fillers to a depth of 1/4 inch below surface of joint. Where depth of joint is not sufficient to require joint filler, install bond breaker tape to cover full width and length of joint cavity to prevent three sided adhesion.
 - 4. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Joint Width: Width-to-depth ratio of sealant as recommended by sealant manufacturer. Do not exceed a depth of 1/2 inch when joint is 1/2 inch wide; joints exceeding 1/2 inch in width shall not exceed 1/4 inch in depth.
- F. Mixing: Mix two component sealant in accordance with manufacturer's directions using premeasured units. Do not thin or adulterate sealant in any way.
- G. Installation of Sealants: Apply sealant over backing to uniform thickness in continuous beads, filling all joints and voids solid; superficial pointing with skim bead will not be accepted. Use nozzle of proper size to completely fill the joints.
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- H. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads, free of air pockets; ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint.
 - 1. Provide concave joint configuration, unless noted otherwise.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 - 4. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.
- I. Sand Texture: Provide fine sand texture at exterior joints as specified; apply sand before surface skins by blowing onto sealant surfaces to provide finish texture matching approved sample.

- J. Pourable sealants shall be applied by gun or by pouring, filling the joint completely with a slight recessed finish. Additional material shall be added if low spots develop. Seal along outside slab edges of joints to prevent water from entering cavity formed by backer rod.

3.4 CLEANING

- A. Clean off excess sealants 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.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Flush solid-core high-pressure decorative laminate doors.
 - 2. Pre-fitting and pre-machining by door manufacturer to hang in existing frames.
- B. Related Sections:
 - 1. 018113 – Sustainable Design Requirements
 - 2. 018119 – Indoor Air Quality (IAQ) Requirements
 - 3. 060620 – Decorative Plastic Laminate
 - 6. 087100 – Door Hardware
 - 7. 087300 – Door and Hardware Installation
- C. Substitutions: Substitute products will be considered only under terms and conditions specified in Section 012500 – Substitution Procedures.

1.2 SUBMITTALS

- A. General: Make submittals in accordance with Section 013300 – Submittal Procedures.
- B. Product Data: Submit door manufacturer's product data for each type of door, including core and edge construction, types of adhesive, factory machining criteria, and finishing specifications for doors to receive factory finish.
- C. Shop Drawings:
 - 1. Submit shop drawings indicating size and elevation of each door type; fire ratings; dimensions and method of securing stiles and rails; dimensions and location of hardware blocking; special beveling; undercuts required; cutouts for glazing and type of stops; preparation for field installed protection panels; and other pertinent data.
 - 2. Include a schedule of doors using same door and opening numbers as shown on drawings.
 - 3. Include copy of installation instructions from door manufacturer for each component gasket system to be used. Instructions must specifically name the door manufacturer or door manufacturer and frame manufacturer as applicable.
 - 4. Submittals without compliance information and instructions for gasket systems will not be reviewed.
- D. Hardware Instructions: Submit list of instructions and procedures enabling hardware to be located and installed on doors and frames without voiding labeled fire assembly.
- E. Samples: Submit samples for the following:
 - 1. Provide finish samples per section 060620.
 - 2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edgings.
- F. Warranty Draft: Submit draft of warranty for review. Submit draft warranty with product data.

1.3 QUALITY ASSURANCE

- A. Quality Standards: Provide flush doors complying with one of the following standards as indicated:
 - 1. NWWDA I.S. I.S. 1A "Architectural Wood Flush Doors", published by National Wood Window and Door Association, except as modified in this Section.
 - 2. AWI/AWMAC/WI Architectural Woodwork Standards, Edition 1, Section 9 – Doors. In the event of conflict with NWWDA standard, comply with AWI.
- B. Single Source: Obtain doors and wood veneer and solid stock each from a single manufacturer to ensure uniformity in quality of appearance and construction. Approved door manufacturers are listed under PART 2 - PRODUCTS of this Section.
- C. Door Finisher Qualifications: Firm shall be regularly engaged in the business of finishing architectural wood doors and millwork items and have sufficient production capacity to finish, transport, and deliver doors without causing delay in the Work.
 - 1. Finishing shall take place in a controlled environment which has a fully automated finishing area.
 - 2. Firm shall have an established quality control program in-place to inspect doors during the various finishing steps.
 - 3. Must have field personnel available to conduct a final inspection of installed doors for signs of damage and be able to do any required touch-up work.

1.4 DELIVERY, STORAGE & HANDLING

- A. General: Comply with requirements specified in Section 016000 - Product Requirements.
- B. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with manufacturer's instructions and recommendations of ANSI/WDMA I.S. 1-A appendix entitled "How to Store, Handle, Finish, Install and Maintain Wood Doors". Package doors individually prior to shipping using door finisher's standard method. Break seal on site to permit ventilation.
- C. Do not deliver or install doors before building's design temperature and humidity levels have been achieved and maintained at those levels.
- D. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

1.5 WARRANTY

- A. Manufacturer's Warranty: Submit written warranty signed by manufacturer, Installer, and Contractor agreeing to repair or replace defective doors which have warped (bow, cup or twist), which show photographing of construction below face veneers, delamination of face veneers, or do not conform to tolerance limitations of AWI.
 - 1. Provide warranty for "Life of the Original Installation".
 - 2. Include provisions for re-hanging and re-finishing of defective doors at no additional cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. All doors are to be products of one manufacturer.
 - 2. Subject to compliance with requirements of this Section, products of the following door manufacturers may be used in the Work.
 - a. Algoma Hardwoods, Inc.
 - b. Eggers Industries,
 - c. Lynden Door
 - d. Vancouver Door.
 - e. VT Industries, Inc.
 - 3. Basis of Design: VT Industries, Heritage Collection.
- B. Category Types: Category A doors are preferred. Category B doors will be accepted only if specified hardware cannot be used without voiding the label or labeling procedures.

2.2 FLUSH SOLID-CORE HIGH-PRESSURE DECORATIVE LAMINATE DOORS (WD DR-01**)**

- A. Solid Core Door Construction: AWI "Type PC-5" or "Type "SCLC-5" for non-rated doors.
 - 1. Grade: Custom.
 - 2. Faces: Refer to drawings
 - 3. Exposed Vertical and Top Edges: Match Faces, but any cut acceptable.
 - 4. Core: Particleboard
 - 5. Door Thickness: Coordinate with existing frames to remain
 - 6. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
 - 7. Stiles And Rails:
 - a. Stiles: 1-3/8 inches wide, before prefitting, structural composite lumber (SCL), edged with high-pressure decorative laminate before face laminates.
 - b. Rails: Structural composite lumber (SCL); Minimum Width Before Prefitting: 1-3/8 inches.
- B. Particleboard-Core Doors:
 - 1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2, made with binder containing no urea-formaldehyde resin.
 - 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
 - 3. Provide doors with structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.
 - 4. Construction: 5-ply construction. Glue stiles and rails to core under pressure with no voids; sand stiles, rails, and core as a unit prior to applying crossbands.
 - 5. Adhesive: Formaldehyde-free; Type II for assembling core parts; Type I or II for bonding faces and crossbands to core.

- C. Hardware Blocking: Provide mill option kiln-dried hardwood blocking at top, bottom and lock blocks to meet manufacturer's labeling requirements. Top and bottom blocking, minimum 5 inches deep by full core width; lock blocks minimum 5 inches deep by 10 inches minimum both sides. Full core width intermediate blocking, minimum 5 inches deep, may be used at lock location in lieu of separate lock blocks provided doors meet labeling requirements.
- D. 7-Ply and Non-Bonded Core Construction: Not acceptable.

2.3 DOOR FRAMES

- A. Existing frames to remain.

2.4 FABRICATION

- A. General: Provide factory pre-fit and pre-machined doors. Furnish door manufacturer with the following:
 - 1. Approved hardware schedule prior to fabrication.
 - 2. Current templates for builders hardware affecting door preparation.
 - 3. Approved shop drawings on frames, including locations and backset for hardware preparations.
 - 4. Stile Edges: Apply laminate edges before application of face laminates.
 - 5. Top and Bottom Rails: Factory sealed with wood sealer.
- B. Allowable Tolerances:
 - 1. Stile, Rail, and Core Photographing: Doors are considered defective when face of door varies from true plane in excess of 0.010 inch in any 3 inch span.
 - 2. Warp: Warp is considered a defect when maximum deviation exceeds dimensions specified in AWI 1400-T-3.
 - 3. Pre-fitting and Pre-machining Tolerances: Fabricate doors to tolerances and clearances specified in NFPA 80 for rated doors and in AWI 1300-G-20 for non-rated doors.
- C. Edge Machining: Except where otherwise required by Code, bevel lock and hinge edges 1/8-inch in 2-inches on all single doors; ease all edges.
- D. Cutouts: Make cutouts in door faces and edges required for installation of hardware, glazing, and access control devices as scheduled. At non-rated openings, tack frames in place. Completely install frames at rated openings to comply with labeling requirements. Seal cut edges at factory.
- E. Access Control Coordination: Provide holes in frames and door cut-outs to accommodate all specified access control devices.

2.5 SHOP FINISHING

- A. General: Finishing of doors and frames must be accomplished in a controlled environment, well lighted and free of dust. Procedures must be established to inspect doors during various finishing steps to ensure that quality control procedures are enforced.

- B. Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises.
 - 2. Field finish doors indicated to receive opaque finish.

2.6 SHOP PRIMING

- A. Doors and Frames for Opaque Finish: Shop prime doors with one coat of wood primer compatible with latex finish coats specified in Section 099000 – Painting and Coatings. Seal all four edges, edges of cutouts, and mortises with execution.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
- B. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
- C. Reject doors with defects.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: Installation of hardware for wood doors is specified in Section 087300 – Door Hardware Installation.
- B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
 - 2. Install doors plumb, square and level in accordance with manufacturer's recommended procedures and requirements of referenced standards.
 - 3. Completely install frames at rated openings to comply with labeling requirements.
- C. Minimize field fitting to those procedures that are necessary to complete work unfinished during factory prefitting and to provide trouble free operation. Refer to Article entitled "Quality Assurance" for requirements on field cutting of rated doors.
- D. Installation Clearances: Hang and fit doors to maintain the following clearances:
 - 1. Head and jambs: 1/8 inch maximum.
 - 2. Meeting edges of pairs: 1/8 inch maximum.
 - 3. Clearance under Doors:
 - a. Doors with sills: 3/8 inch maximum to raised non-combustible sill.
 - b. Doors without sills: 3/4 inch maximum to floor, i.e. concrete or noncombustible substrate.
 - c. Between door and floor coverings: 1/2 inch maximum.

- d. Between door and floor tile: 5/8 inch maximum.
 - e. Exceptions: Reduced clearances as specified by hardware manufacturer's template, plan details or notes in Opening Schedule.
 - 4. Doors with Astragals: Adjust doors so astragal lies flat against adjacent door face.
 - E. Clearances for Accessories: Provide clearances in accordance with manufacturer's recommendations for scheduled seals or gaskets.
 - F. Demonstration: Upon completion of hanging, demonstrate that doors operate freely without binding, and when closed with moderate force will latch properly.
- 3.3 FIELD TOUCH-UP
- A. Field touch-up of shop finished doors and frames shall be the responsibility of the door finisher and shall include the refinishing of raw surfaces resulting from job fitting, repair of job inflicted scratches and mars, and final cleaning of the finished surfaces. Field touch-up work on wood doors and frames shall show no evidence of the restoration.
 - 1. This inspection and touch-up work shall take place no later than 10 days prior to requesting Architect's and Owner's Representative inspection at time of Substantial Completion.
 - 2. Use same materials for making repairs; follow written instructions for preparing surfaces and application.
 - 3. If refinished door cannot be made to match other undamaged doors, refinished door must be replaced at no additional cost to Owner.
- 3.4 CLEANING
- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
 - B. Do not use harsh cleaning materials or methods that could damage finish.

END OF SECTION 081416

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall access doors installed over existing devices, indicated as **(AD-##)** on drawings.
- B. Provision of access doors/panels for HVAC, plumbing, fire protection and electrical equipment access are specified as Work of the separate Sections of this Specification and as the responsibility of the trade requiring access. General Contractor shall coordinate type and quantities with trade requiring access and assumes full responsibility for insuring that all access doors/panels are provided in types and sizes necessary. Obtain Architect's approval for all locations not shown.
 - 1. Unit Price Request: Provide unit price for additional access doors of sized indicated in accordance with Section 012200 – Unit Prices.
- C. Related Sections:
 - 1. 012200 – Unit Prices.
 - 2. 092116 – Gypsum Board Assemblies: Installation of access doors in drywall and gypsum plaster areas.
 - 3. 099000 – Painting and Coating.

1.2 SUBMITTALS

- A. General: Make submittals in accordance with Section 013300 – Submittal Procedures.
- B. Product Data: Submit product data showing materials and installation instructions for each type of access door assembly, including details of construction, individual components, finishes, and fire ratings (where required).
 - 1. Installation Schedule: Show access door types, general locations, sizes, latching or locking provisions, gasketing and other data pertinent to installation.
- C. Access Door and Frame Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

1.3 QUALITY ASSURANCE

- A. Single Source: Obtain each different type of access doors for entire Project from one source and by a single manufacturer.

1.4 PROJECT CONDITIONS

- A. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment and indicate on submittal schedule.
- B. Coordination: Advise Installers of other work about specific requirements relating to access door installation, including sizes of openings to receive access door and frame, as well as locations of inserts and anchoring devices. Furnish inserts and anchoring devices for access doors that must be built into other construction. Coordinate delivery with other work to avoid delay.

1. Confirm flange and frame type for flush appearance to adjacent surfaces, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 STEEL MATERIALS

- A. Steel Sheet: Uncoated or electrolytic zinc-coated, ASTM A 591/A 591M with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- B. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 1. Surface Preparation for Steel Sheet: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
 2. Factory-Primed Finish: Apply shop primer immediately after cleaning and pretreating.

2.2 WALL & CEILING ACCESS DOORS

- A. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation. Obtain Architect's approval of manufacturer's standard size unit which may vary slightly from sizes indicated on drawings.
- B. Non-Rated Access Doors in wall panels (**AD-01**): Nystrom NTC Series or equivalent by JL or Milcor; size as indicated on drawings.
 1. Frames, 16 ga steel with 1" wide flange of 24 ga galvanized steel for mounting; doors, 14 gage steel.
 2. Hinges: Manufacturer's standard concealed hinges, zinc plated.
 3. Hardware: Provide with flush screwdriver operated cam latches; minimum of (2) latches per door where greater than 12" opening
 4. Finish: Field painted over manufacturer's standard factory-applied primer.

2.4 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.
 1. Provide mounting holes in frames for attachment of units to metal or wood framing.
- D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed. Provide self-latching with flush, non-key lock operated via blade screwdriver.

- E. Extruded Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
- C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.2 ADJUSTING AND CLEANING

- A. Adjust doors and hardware after installation for proper operation.
- B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION 083113

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Provide complete door hardware and suitable fastenings for the Project in accordance with Drawings, Specifications, and Schedules.
2. Furnishing items of proper design for use on doors and frames of the thicknesses, profile, swing, security and similar requirements indicated, as necessary for proper installation and function.
3. Furnishing items not specifically mentioned, but necessary to complete the work. These are to match quality and finish of the items specified.

B. Related Sections:

1. Section 081416 - Flush Wood Doors
2. Section 087300 – Door and Hardware Installation

C. Quantities: Those listed in any instance are for subcontractor's convenience only and are not guaranteed.

1.2 REFERENCES

A. Standards: Current edition at date of bid.

1. ADAAG - Americans with Disabilities Act, "Accessibility Guidelines for Buildings and Facilities".
2. ANSI/BHMA A156.18 - Materials and Finishes
3. ICC/ANSI A117.1 - Accessible and Usable Buildings and Facilities
4. NFPA 80 - Standard for Fire Doors and Windows
5. NFPA 252 - Standard of Fire Tests of Door Assemblies
6. Underwriters Laboratories - Building Materials Directory
7. Underwriters Laboratories Test Standard UL 10C - Positive Pressure Fire Tests of Door Assemblies

B. Codes:

1. International Building Code
2. Chapter 51-50 WAC Washington State Building Code
3. Seattle Building Code

1.3 SUBMITTALS

A. General Requirements: All Submittals shall be in accordance with Section 01 33 00, Submittal Procedures.

B. Product Data: Submit manufacturer's data for each item of door hardware.

- C. Hardware Schedule: Submit a detailed Door Hardware Schedule.
1. The submitted Door Hardware Schedule shall indicate the complete designation of every item required for each door or opening.
 2. Furnish cover sheet listing title of project as shown on the Contract Documents, name, address, phone and fax numbers of Owner, Architect, Contractor, and Supplier, name of Certified Hardware Consultant, and date of submittal.
 3. List each opening individually under separate headings in the same order as the door schedule. Do not continue headings on separate pages.
 4. Each heading shall indicate opening location, handing, degree of opening, door size, type, fire rating, and Door and Frame material.
 5. Indicate product Manufacturer and incorporate cross-reference to symbols used in Article 2.15 Hardware Schedule.
 6. A cross reference for any abbreviations or symbols used shall be included.
 7. Schedules in coded or horizontal format are unacceptable.
 8. Submittals not conforming to these requirements will be returned without review, for re-submittal. Following is an example of the required format:

1 Sgl. Door #104A – Corridor 102 from Waiting 104	3-0 x 7-0 x 1-3/4" x 20 Minute x Type D	RHR 90°	SC WD x HMF
3 Each Hinges (B2)	MC	TA2714 US26D (652)	4.5 x 4.5 x 1/2MS
1 Lockset (L4)	SC	L9070L 03B 630 RHR	
1 Door Closer (C2)	LCN	4040XP-EDA Alum. (689)	x SB
1 Kick Plate (K2)	TI	B4EKP – 10 x 34.5 – US32D	x CTSK
1 Wall Stop (S1)	TR	1270CX US32D (626)	
1 Set Gasket (W1)	PE	S88D – 17' per Set	
 9. Processing: Hardware schedules will not be reviewed by Architect until they have been reviewed and approved by Contractor. Resubmit only corrected copies of those sheets requiring correction and update distributed copies with corrected sheets.
 10. Modifications: Update Hardware Schedule and keep current throughout project duration.
 - a. Incorporate revisions conforming to specified requirements.
 - b. Submit only cover sheet and revised pages.
 - c. Clearly identify changes from previous submittal content.
- D. Samples: When by the Architect, submit one (1) sample of each exposed hardware category, finished as required, and tagged with full description for coordination with the hardware schedule.
1. Samples will be reviewed by the Architect, for design and finish only
 2. Accepted, undamaged samples may be used on the project.
- E. Color Samples: Submit Three (3) set of color charts and physical samples of each product requiring color selection.
- F. Key Schedule: Submit a keying chart for approval. Chart shall include door number, location, lock function, keying layout, and quantity of keys. Deliver two copies of approved keying chart, complete with key number, with keys.

G. Operations and Maintenance Data.

1. Submittals: Submit Maintenance and Operations Manuals under provisions of Section 01 70 00, Project Closeout.
2. Content: Manuals shall contain final copy of the Door Hardware Submittal, Product Data, Templates, Parts Lists and Diagrams, Key Schedule, Installation and Maintenance Instructions, and Wiring Diagrams.

1.4 QUALITY ASSURANCE

A. Supplier:

1. Recognized builders' hardware supplier who has been furnishing hardware in the same area as the project for a period of not less than five (5) years.
2. Factory direct, authorized, and stocking distributor of the Exit Devices, Locksets and Door Closers.
3. Employing an Architectural Hardware Consultant, certified by the Door and Hardware Institute.

B. Source: Obtain each kind of Hardware (Butts, Locksets, Exit Devices, Door Closers, etc.) from only one manufacturer.

C. Installer: Door hardware shall be installed only by experienced tradesmen in compliance with trade union jurisdictions, either at the door and frame fabrication plant or at the project site.

D. Templates: Furnish hardware templates for each fabricator of doors, frames and other work to be factory prepared for the installation of hardware. Upon request, check the shop drawings of such other work to confirm that provisions will be made for the proper installation of hardware.

E. Regulatory Requirements:

1. Code Compliance: All finish hardware shall comply with applicable local and/or state current building codes. All door hardware shall meet the requirements of ICC/ANSI A117.1 – Accessible and Usable Building and Facilities.
2. Product Compliance: Provide only hardware which has been tested and listed by recognized testing agency for the types and sizes of doors required, and which complies with the requirements of the door and door frame labels. Provide Door Closers, Automatic self latching bolts, coordinators, gasketing, and astragals if required to conform to label requirements.

1.5 PRODUCT HANDLING AND STORAGE

A. Packaging: Each item or package is to be separately tagged with identification related to the final hardware schedule. Basic installation instructions shall be included in the packages.

B. Storage: Provide a locked room at the jobsite for the storage of the hardware.

1.6 WARRANTY

A. Coverage: Door hardware shall be guaranteed against defects in workmanship and operation for a period of one (1) year, backed by a factory guarantee of the hardware manufacturer. The following products shall be guaranteed for periods beyond one (1) year:

1. Locks – Two (2) Years

2. Door Closers – Ten (10) Years

1.7 MAINTENANCE

- A. Special Tools: Provide One (1) Set of Special Tools required for installation and adjustment

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND SUBSTITUTIONS

- A. Manufacturers: Products may be furnished by the manufacturers listed under “As Specified” below, or equivalent products of type, grade, design, and function from manufacturers listed under “Acceptable Substitutions”. Requests for products not listed must be made in accordance with Section 01 25 00, Substitution Procedures.

Product Category	As Specified	Acceptable Substitutions
Butt Hinges	McKinney	Bommer, Hager, Ives
Continuous Gear Hinges	Pemko	ABH, Ives, McKinney, Select Products
Continuous Pin Hinges	Makar	ABH, Select Products
Locksets and Latchsets	Schlage	Corbin/Russwin ML2000, Sargent 8200
Battery Powered Card Reader Locksets	Saflok	Pre-approved equal
Sliding Door Locks	Accurate	None
Cylinders and Keying	Schlage	Corbin/Russwin, Sargent
Exit Devices	Von Duprin	Corbin/Russwin ED4000/5000 Sargent 80 Series
Surface Door Closers	LCN	Corbin/Russwin DC6000, Sargent 351
Power Transfers	Von Duprin	Securitron
Automatic and Manual Flush Bolts	Ives	Door Controls, Rockwood
Coordinators	Ives	Door Controls, Rockwood
Door Pulls, Pull and Push Plates	Trimco	Rockwood, Tice
Kick & Mop Plates	Tice Industries	Ives, Rockwood, Trimco
Wall and Floor Stops	Trimco	Ives, Rockwood
Overhead Stop and Holders	Glynn-Johnson	Rixson, ABH
Electro-Magnetic Door Releases	Rixson	ABH, DynaLock, LCN
Weatherstrip	Pemko	National Guard, Reese, Zero
Thresholds (General)	Pemko	National Guard, Reese, Zero
Thresholds (Carpet Separator)	National Guard	None
Thresholds (Communicating Doors)	Zero	None
Key Cabinet	Telkee	Lund
Heavy Duty Sliding Door Hardware	PC Henderson	Richards Wilcox
Castors	Albion	Payson
Door Guards	National Guard	Pemko

2.2 HARDWARE MATERIALS AND FABRICATION

- A. Fasteners: Provide fasteners for installation with each hardware item. Provide Phillips head fasteners, countersunk oval, flat head, or undercut head as appropriate for material to be installed. Provide Door Closers and Exit Devices applied to Wood Composite or Mineral Core Doors with Sex Bolts sized to the Thickness of the Door.

- B. Compatibility: Provide fasteners which are compatible with both unit fastened and substrate, and which will not cause corrosion or deterioration of hardware, base material, or fastener.

2.3 HARDWARE FINISHES

- A. General: Unless specifically indicated otherwise, provide architectural hardware in the following finishes.
- B. Messenger/LENS training: up to 501 and up rooms.

2.4 HARDWARE SCHEDULE

HW:01

QTY		DESCRIPTION	CATALOG NUMBER
6	EA	HINGE	5BB1 4.5 X 4.5
2	EA	MANUAL FLUSH BOLT	FB458
1	EA	DUST PROOF STRIKE	DP1
1	EA	LOCK	MATCH EXISTING
1	EA	CYLINDER	RE-USE EXISTING
2	EA	OH STOP SURFACE	90_S
1	EA	GASKET	9117

FINISH: MATCH EXISTING
MFR: MATCH EXISTING

PART 3 - EXECUTION

3.1 PREPARATION

- A. Installation is specified in Section 087130.

END OF SECTION 087100

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hanging of new swinging doors in existing frames.
2. Installation of hardware specified under Section 087100 – Door Hardware.
3. Adjustment and lubrication.

B. Related Sections:

1. 018119 – Indoor Air Quality (IAQ) Requirements.
2. 081416 – Flush Wood Doors
3. 083100 – Access Doors and Panels
4. 092116 – Gypsum Board Assemblies: Metal blocking for support of surface applied hardware.

1.2 QUALITY ASSURANCE

- A.** Installers of doors and hardware shall be skilled mechanics experienced in this type of work.
- B.** Handicapped Accessibility Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.
- C.** Mounting Heights: Mount door hardware units to coordinate with existing frames to remain.

PART 2 - PRODUCTS

2.1 DOORS, FRAMES, AND HARDWARE

- A.** Doors, frames and hardware are specified in other sections.

PART 3 - EXECUTION

3.1 GENERAL

- A.** Install doors at all locations for which hinges (butts or pivots) are scheduled in Section 087100 – Door Hardware.
- B.** Install hardware scheduled in Section 087100 – Door hardware.
- C.** Verify prefabricating and pre-machining tolerance and clearances in accordance with NFPA 80 and AWI 1300-G-20 (AWI Quality Standards, Current Ed.).

3.2 FINISH HARDWARE INSTALLATION

- A.** General: Mount door hardware units to coordinate with existing frames to remain. Products not specifically covered shall be installed in accordance with the manufacturer's templates and instructions.

1. The Installer shall verify all dimensions and be responsible for the correct installation and fit of hardware at the locations indicated on the drawings and as specified. All questions regarding the placement of hardware shall be directed to the Architect for clarification prior to installation of items under question.
 2. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting are required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, reinstall each item. Do not install surface-mounted items until finishes have been completed on the substrate.
 3. Set items level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for a secure installation. Drill and countersink items which are not factory prepared for anchorage fasteners. Space fasteners and anchorage's as indicated or in accordance with industry standards.
 4. Notify Architect of doors which have been improperly templated; do not proceed with installation of hardware on such doors until direction has been received from the Architect.
 5. Wall mounted hardware shall be attached to conceal wall blocking. The installer shall advise the Contractor where blocking for wall mounted hardware is missing and shall not install such items until blocking has been installed.
- B. Hinges: Doors shall be hung within the following tolerances: 1/8 inch maximum between the door and frame, and 1/8 inch maximum between the meeting edges of pairs of doors. Where shimming is necessary for proper door/frame installation, use only metal shims.
- C. Door Stops: Floor stops shall be installed to permit the maximum degree of door swing that the locations permit, and located so as not to create a tripping hazard. All stops should be located to catch the door at a point 6 inches in from the latch edge, but in no case any further than 1/3 the door width measured from the latch edge. Wall stops intended for knobs and levers shall be located on the centerline of the spindle.

3.3 FINISH CLEARANCES

- A. General: Unless otherwise indicated in individual technical sections comply with following clearances:
1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold.
 - a. Fire Rated Doors: Comply with NFPA 80 for fire-rated doors.

3.4 FINISHING REQUIREMENTS

- A. Factory-Finished Doors: Restore finish acceptable to Architect and Owner before installation if fitting or machining is required at Project site.

3.5 ADJUSTMENT AND CLEANING

- A. Adjust and check each item of hardware and each door to ensure proper operation of function of every unit. Lubricate moving parts with graphite type lubricant unless otherwise recommended by the hardware manufacturer. Replace all hardware which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

- B. Upon completion of the work, the hardware supplier in the presence of the Owner's Representative, shall verify fit and operation of each lockset with the proper change key which voids the construction key. The keys shall then be tagged with the door number and delivered to the Owner's Representative.

3.6 FINAL ADJUSTMENT

- A. Wherever hardware installation is made more than 1 month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean and lubricate operating items as necessary to restore proper function and finish of hardware and doors. Make final adjustment of locksets and closers to compensate for operation of heating and ventilating systems. Closer manufacturer's representative shall make final closer adjustment.
- B. Protect all items of finish hardware from damage until acceptance of the building.
- C. Instruct Owner's maintenance personnel in proper adjustment of hardware and hardware finishes during the final adjustment of hardware.

3.7 SPECIAL TOOLS

- A. Provide two (2) sets of any special tools required for installation and maintenance of hardware to the Owner's Representative upon completion of the work in accordance with requirements specified in Section 017800 – Closeout Submittals.

END OF SECTION 087130

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. Framing systems.
- B. Related Requirements:
 - 1. Section 092900 "Gypsum Board" for wallboard systems.

1.3 DEFINITIONS

- A. Load Bearing Metal Support Systems: Cold formed metal framing assemblies supporting axial and/or transverse loads in addition to loads that may be directly attached to the framing. Refer to Section 054000 – Cold-Formed Metal framing
- B. Non-Load Bearing Metal Support Systems: Cold formed metal framing assemblies supporting only loads directly attached to the framing and minor axial and/or transverse loading not greater than 5 psf, except as indicated otherwise.
- C. Suspended Metal Support Systems: Cold formed metal framing assemblies, generally horizontal, characterized by wire hanger supports and supporting only loads attached to the framing.

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Framing systems.
 - 2. Suspension systems.
 - 3. Grid suspension systems.
 - 4. Submit specific assembly requirements for each different composite assembly, including the following:
 - a. Structural Performance Data: For each different assembly, submit data indicating gage and framing requirements based upon size of framing required, framing heights/configuration, composite assembly configuration, and structural performances required.
 - b. Fire Design Requirements: For each rated assembly, submit framing requirements which have been coordinated with requirements of materials forming composite assembly.
 - c. Head of Wall Fire Rated Assemblies: Submit UL Listed components accompanied with product evaluation report, ICC-ES listed or as required by the governing code authority.
- B. Shop Drawings: Submit shop drawings showing fabrication and installation of the suspended ceiling framing systems and wall framing support systems, including methods of anchorages and details of connections within the assemblies and to adjoining construction.
 - 1. Show spacing, sizes, weights or gages of all framing members.

2. Show lateral bracing for each different type of partition assembly which extends above the ceiling, but not to structure; bracing shall meet the load resistance as specified.
 3. Submit shop drawings for special types of suspension systems under mechanical platforms ceiling reflectors showing fabrication and suspension method, designed by Structural Engineer, etc.; show calculations and sizes of all members.
 4. Submit drawings showing materials and methods for firestopping at head of rated walls and connecting floor or roof deck assemblies; indicate UL or Warnock Hersey listing numbers, including views or conditions (parallel and transitional) of proposed construction, complete with mounting accessories.
 5. Show type of anchors proposed for support of ceiling suspension systems; include required tension or pull-out values which must be met in the field to comply with overall ceiling design.
 6. Clearly indicate on shop drawings any proposed deviations or changes from Contract Drawings. Architect's approval is required for any proposed deviation or change. Any such deviation or change shall not alter the visual appearance or the overall plaster thicknesses as specified.
- C. Coordination Drawings: Coordinate installation of suspension systems with installation with following elements of the Work:
1. 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.
 2. Ceiling suspension and supporting assemblies are located with other trades, including but not limited to air distribution system; lighting (recessed and surface mounted); fire-protection piping; concealed metal fabrications; art attachment points; A/V and Tele-data outlets and recess assemblies as indicated.
 3. Sprayed fireproofing indicated in Section 0781 "Applied Fire Protection."
- D. Design Data: Where designs are not verifiable by Structural Performance Data, submit structural design calculations referenced to shop drawings for all framing members and anchorages demonstrating compliance with structural criteria previously specified. Calculations shall indicate the required ultimate strength and tension values in pounds for all anchors used in ceiling support. Calculations shall be prepared, stamped and signed by a Structural Engineer, licensed in the State of Washington.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation Reports: For firestop tracks and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
- C. Product Test Reports: Submit laboratory tests certifying STC ratings for acoustically rated partitions as indicated.
- D. Fire Assembly Certification: For each fire assembly, Installer shall certify in writing that installed metal support systems are in conformance with types of assemblies required at each location, including for coordination with specific assemblies of other components affecting each fire assembly and for compliance with requirements of Code and authorities.
- 1.6 QUALITY ASSURANCE
- A. Codes: Comply with all pertinent requirements of the Authority Having Jurisdiction.

- B. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Stud Manufacturers Association.
- C. Allowable Installation Tolerances: Provide framing to conform with the following allowable tolerances:
 - 1. Partition Framing Location: Within plus or minus 1/4-inch of required locations.
 - 2. Partition Framing Members: Plumb within plus or minus 1/8 inch from the plane formed by faces of adjacent framing.
 - 3. Ceiling Framing: Level within 1/8-inch in 12 feet and erected so that deflection of any component does not exceed deflection limits as indicated in design criteria after installation of all finish materials and equipment.
 - 4. Curved Framing: Form to true and uniform lines using standard shaped track or pre-engineered track and studs forming curve(s) with straight lengths tangent to arcs.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Notify manufacturer of damaged materials received prior to installation.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Installation Standard for Framing: ASMT C754 for the following assemblies:
 - 1. Gypsum Board Assemblies: Also comply with requirement in ASTM C840 that apply to framing installation.
- B. Design Responsibility: Employ a registered engineer, licensed in the State of Washington, to design stud wall framing systems that are not indicated on stud load and limiting heights tables.
 - 1. Design Criteria for Metal Support Assemblies: ASTM E72.
 - a. Wall Support Framing: Resist lateral force of 5 pounds per square foot for full height partitions, and 200 pounds concentrated load applied anywhere over 10 sq. ft area for partial height partitions, and 100 pounds concentrated load for wall mounted light fixtures.
 - 1) Deflection, Typical: Not to exceed L/240 of the span; and L/360 behind tile.
 - 2) Stud Spacing: per design-build unless noted otherwise
 - b. Wall Support Framing with Wall Mounted Casework and Equipment: Resist lateral force of 15 pounds per square foot for full height partitions, and 200 pounds concentrated load applied anywhere over 10 sq. ft area for partial height partitions.
 - 1) Deflection, Typical: Not to exceed L/240 of the span.
 - 2) Stud Spacing, Typical: Per design-build, unless noted otherwise
 - c. Ceiling Suspension Systems (Direct Hung): Comply with the minimum sizes and maximum spans for main runners and cross furring channels as indicated in ASTM C 754.
 - 1) Live Load: Meet Heavy-Duty Class per ASTM C635.
 - 2) Deflection, Typical: Not to exceed L/360.
 - d. Ceilings, GWB (And other false ceilings where access is not required) Framing: Design to support the following loading as indicated in ASTM C 754 guidelines:

- 1) Live Load: 6 psf plus weight of steel framing.
 - 2) Deflection, Typical: Not to exceed $L/360$.
 - e. Seismic Forces: Engineer to percent greater than required by governing codes as follows:
 - 1) Interior Partitions at Stairs and Elevators: 10% greater.
 - 2) All Other Interior Partitions: 20% greater.
 2. When wall is braced to roof structure with kickers, the stud span between the brace, floor, and stud span between the brace and roof, shall not exceed the limiting height. Provide kickers and knee braces with stiffness that does not require cross bracing between members.
- C. Wall Support Framing System Design: Provide assemblies as indicated, but in no case less than meeting design criteria above. Design shall include all attachments to the building structure.
 1. Stud depths are indicated on drawings. Any deviation from stud depths indicated must be approved by the Architect at time of shop drawing review.
 2. Stud depth and spacing of studs which are indicated on the drawings and gages specified herein are intended to set limitations base on acceptable practice, but have not been engineered. Any increase or decrease in stud gage(s) or closer stud spacing to meet the deflection and load requirements shall be accomplished at no additional cost to the Owner.
 3. Typical partition and ceiling studs shall be as required for loads indicated, framing conditions, and composite assembly configuration, but in no case less than 25 gage except for studs adjacent to door frames and borrow light frames shall be not less than 18 gage, with 1-1/2-inch long welds along face between flanges at 8 inches O.C. Provide double studs at all door frames and elsewhere as indicated on drawings.
 4. Supplemental Wall Backing Plates: Refer to details on the drawings.
 5. Stud deflection track shall be required for loads and deflection allowances indicated.

2.2 FRAMING SYSTEMS

- A. Manufacturers: Acceptable manufacturers for non-structural metal framing:
 1. ClarkDietrich Building Systems
 2. SCAFCO Steel Stud Company
 3. Cemco
 4. MarinoWARE
 5. MBA Building Supplies
- B. Framing Members, General: Comply with AISI S220, Section 10 for conditions indicated.
 1. Steel Sheet Components: Comply with AISI S220, Section 10 requirements for metal unless otherwise indicated.
 - a. Steel sheet having a minimum yield strength of 33,000 psi; roll-formed "C" shaped with not less than 1-1/4 inch flange with 1/4 inch nominal return, and pre-punched webs for installation of mechanical and electrical items.
 2. Protective Coating: Comply with AISI S220; ASTM A653/A653M, G40; or coating with equivalent corrosion resistance. Galvannealed products are unacceptable.
 - a. Coating demonstrates equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.
- C. Studs and Track: AISI S220.
 1. Minimum Base-Steel Thickness: As required by performance requirements for horizontal deflection.
 2. Depth: As indicated on Drawings.
 3. Track: Provide top track with minimum 1-1/2 inch long legs, or as required to meet the deflection criteria.

- D. Flat Strap and Wall Backing Plates: Fabricate from galvanized steel stud runners, not less than 20-gage by 6 inches wide.
 - 1. Acceptable to use 20-gage flat metal strapping at lighter load items requiring backup such as tackboards, signage and mirrors.
 - 2. Option: Manufacturer Metal-Lite: website: www.metal-lite.net
 - a. Product: Flush-Mount Backing
- E. Hat-Shaped, Rigid Furring Channels:
 - 1. Minimum Base-Steel Thickness: 0.0179 inch.
 - 2. Depth: 7/8 inch.
- F. Cold-Rolled Furring Channels: 0.053-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges.
 - 1. Depth: As indicated on Drawings.
 - 2. Furring Brackets: Adjustable, corrugated-edge-type steel sheet with minimum uncoated-steel thickness of 0.0329 inch.
 - 3. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.
- G. Z-Shaped and J-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 3/4 inch, minimum uncoated-steel thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.
- H. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-steel thickness of 0.0538 inch and minimum 1/2-inch-wide flanges.
 - 1. Depth: 1-1/2 inches.
- I. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.
 - 2. Hat-Shaped, Rigid Furring Channels: 1 1/2 inch deep.
 - a. Minimum Base-Steel Thickness: 0.0296 inch.
 - 3. Resilient Furring Channels: 1/2-inch-deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Acoustical Sealant Tape (sill gasket): Norton "Norseal Acoustical Sealant V-738", Nashua Corporation "Acoustical Tape", or approved equal; tape to be the width of track by 1/4 inch thick. Provide tape for underside of floor runner tracks, vertical stud intersection to masonry wall and at top tracks of ceiling height partitions as indicated.
- C. Acoustical Sealant: USG "Acoustical Sealant", Protective Treatments, Inc. "808 Acoustical Sealant", or approved equal resilient, non-staining, non-shrinking, non-hardening sealant for interior sealing of concealed construction joints.
- D. All other materials not specifically described but required for a complete installation of metal framing shall be in accordance with the recommendations of the manufacturer of framing materials used.

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. Coordinate installation of backing plates; verify length, height, location and number of backing plates required with manufacturers of items to be supported.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754; except where exceeded by pertinent codes and regulations for rated construction and recommendations of the manufacturer and where otherwise detailed; securely anchor all members in position.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Coordinate and install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLATION OF FRAMING SYSTEMS

- A. General: Construct each partition, including all necessary offsets in framing; adjust location of, and vary size of, studs as required to provide continuous wall planes for their entire extent; vary finish thicknesses if necessary.
- B. Independently support partitions, furring and ceiling suspension systems; do not attach ducts, pipes, etc. to supports. Do not support suspension systems from any electrical, HVAC, plumbing or sprinkler system components. Do not drill or "shoot" into structural members in any manner that would impair its structural integrity.
- C. D. Install framing members to preclude direct physical contact with conduits, pipe, and ducts; coordinate with installation of sleeves for mechanical penetrations.
- D. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- E. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

- F. Studs: Set studs vertically in tracks with open side of studs facing in same direction. Align all punch-out holes in studs within a continuous length of wall to receive utilities. Use full length studs between tracks to full engage top and bottom runner track, except as otherwise indicated. Where partitions extend to structure above (except as required for fire-rated assemblies, above), cut studs short of total height to allow for minimum of 3/4 upward and downward vertical movement at head, and install vertical deflection clips; do not secure studs to top track; studs shall rest on bottom runner track in all conditions.
1. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements. Where studs are placed directly against exterior concrete or masonry walls, install asphalt felt strips between studs and wall surfaces.
 2. Provide positive attachment to bottom tracks for studs at partition corners and intersections and adjacent to door and relight openings using 3/8 inch self-tapping screws on both stud flanges; screw attach or crimp all remaining studs at bottom.
 3. Provide 20 gage by 2 inch wide continuous alignment strap secured to each stud along top as detailed.
 4. Where studs cannot run to underside of construction above due to equipment or ductwork, provide built-up headers consisting of runner tracks and studs spanning the distance.
- G. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
1. Floor Tracks: At partitions indicated to receive acoustical insulation, apply two (2) continuous strips of sealant tape to bottom side of tracks prior to installation; place strips on outside edges. In lieu of sealant tape, two continuous beads of gun grade acoustical sealant may be used
 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 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.
- H. Partitions Which Extend above Ceiling, Not to Structure: Lateral force bracing shall meet the requirements as previously specified. Unless otherwise required by the governing jurisdiction, lateral bracing shall be accomplished by using minimum 20 gage steel "C" studs secured to the runner track and structure above at an angle of 45 degrees from the plane of the ceiling.
1. Place studs not to exceed 4 feet on center; studs may be located on either side of the partition, depending upon obstructions above. Secure studs to top track using two #8 screws, and to structure above using powdered actuated fasteners.
 2. Bracing system shall be per ICC-ES Legacy Report 4071.
- I. Plumbing Chases and Braced Cavity Partitions: Where a partition is indicated to be constructed from double rows of studs, maintain mechanical isolation between rows of studs; coordinate with plumbing and electrical work to ensure that no item is anchored to studs on opposite sides of wall and that acoustical separation is maintained between each side of the partition. Space bracing (runner tracks) not to exceed 16 inches on center horizontally and 4'-0" maximum on center vertically. Fasten to studs with two No. 8 by 1/2 inch long self-drilling, self-tapping screws in each stud.
- J. Column and Beam Clips: Install in accordance with manufacturer's instructions and approved UL Design No.

- K. Direct Furring: Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- L. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 WALL BACKING PLATES

- A. Wall Backing Plates: Attach with flat head sheet metal screws; provide a minimum of three (3) screws per each bearing point.
 - 1. Provide in wall or partition framing system wherever wall-hung cabinets, signage, equipment, accessories, and handrails are indicated on drawings; for all wall-mounted finish hardware, including door stops.
 - 2. Backing plates shall span full length of attached item.
 - 3. Acceptable to use 20-gage flat metal strapping at lighter load items requiring backup such as tackboards, signage and mirrors.
 - 4. Attach wall backing plates, flat straps, bracing and other components within the wall cavity and not to the face of stud flange to prevent uneven gypsum board surfaces when attached to the studs.

END OF SECTION 092216

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.
- B. Related Requirements:
 - 1. Section 092216 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Gypsum board.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
- B. 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.
- C. Handle gypsum boards to prevent damage to edges, ends, or surfaces. Protect metal corner beads, casing beads and trim from being bent or damaged.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
 - 1. Refer to additional requirements for Temporary Heating and Ventilating in Section 015000 – Temporary Facilities and Controls.
- B. Cold Weather Protection: When ambient outdoor temperatures are below 55 degrees F. maintain continuous, uniform, comfortable building working temperatures of not less than 55 degrees F. for a minimum period of 48 hours prior to, during and following application of gypsum board and joint treatment materials.
- C. Ventilation: Provide controlled ventilation during joint finishing operations to eliminate excessive moisture. Avoid drafts during hot, dry weather to prevent excessively fast drying of joint compound.
- D. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- E. Do not install panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each type of gypsum panel and joint finishing material from single source with resources to provide products of consistent quality in appearance and physical properties.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Perform work in accordance with following accepted standards of practice:
 1. ASTM C840 -04a – Standard Specification for Applications and Finishing of Gypsum Board.

2.3 GYPSUM BOARD, GENERAL

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. USG Corporation (Basis of Design UNO)
 2. American Gypsum
 3. Armstrong World Industries
 4. CertainTeed
 5. Georgia-Pacific Gypsum LL
 6. National Gypsum Company
 7. Pabco Gypsum
- B. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.4 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C1396/C1396M.
 1. Manufacturer and Type: USG Sheetrock Brand Ecosmart Firecode X panels, or equivalent meeting all performance criteria except:
 - a. Acoustical assemblies using 25 GA studs: Light-weight wallboard panels acceptable
 - b. Acoustical assemblies using 20 GA or heavier studs: Normal-weight panels shall be used: USG Sheetrock Brand Firecode X or equal
 - c. Rated and Acoustical Ceilings: Normal-weight panels shall be used: USG Sheetrock Brand Firecode X or equal
 2. Thickness: 5/8 inch.
 3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C1047.
 1. Manufacturer: Beadex Manufacturing Co., Inc (Basis of Design) or equivalent meeting all performance criteria except as noted.
 2. Material: Paper-faced galvanized-steel sheet.
 3. Shapes:

- a. Cornerbead.
- b. LC-Bead: J-shaped; exposed long flange receives joint compound.
- c. L-Bead: L-shaped; exposed long flange receives joint compound.
- d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
- e. Expansion (control) joint, typical UNO.
 - 1) Roll-formed zinc trim with tape-protected 1/4-inch opening, 7/16 inch deep. ClarkDietrich "No. 093", or approved equal.
- f. Curved-Edge Cornerbead: With notched or flexible flanges.

2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Exterior Gypsum Soffit Board: Paper.
 - 3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 4. 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 drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound or high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

2.7 AUXILIARY MATERIALS

- A. Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
- C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
- D. Fire Resistant Seal Compound: USG Interiors, Inc. "Firecode Compound", or approved equal
- E. Isolation Gaskets: Norton Norseal V738, or approved equal black PVC with self-adhesive backing, 1/4 inch thick, manufacturer's standard widths to match width of bottom track or rim track members.
- F. Putty Pads: Provide a 1/8 inch thick, self-adhesive, pliable sheet caulking pads to seal airtight the back and sides of all recessed junction, datacom, electrical boxes and similar boxes in all sound-rated assemblies.
 - 1. Acceptable Products: Lowrey Outlet Box Pads.

- G. Closed cell neoprene foam: Resilient, non-hardening, heat resistant neoprene or composite neoprene/rubber blend, minimum 30 durometer, flame spread rating of 25 or less.
 - 1. Acceptable manufacturers: Armstrong Armaflex; Pacific States Felt SCE-42N and/or SC-43BL
- H. Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 - 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).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Comply with ASTM C840 and GA 600 for fire rated assembly requirements and as specified herein, unless otherwise required by local building authorities.
 - 1. Cut gypsum board by scoring through the face paper. Where gypsum board meets projecting surfaces objects, scribe and neatly cut. Smooth ragged cut ends with a rasp or sandpaper, or trim with a sharp knife.
 - 2. Use gypsum wallboard of maximum lengths to minimize end-to-end joints
 - 3. Install panels with face side out. Butt gypsum boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.
 - 4. Place tapered edges next to tapered edges; do not place cut edges or butt ends adjacent to tapered edges.
 - 5. Install gypsum board to ceilings prior to installation at walls.
 - 6. Stagger joints on opposite faces of wall so that joints occur on different studs.
 - 7. Space fasteners not less than 3/8 inch from edges, ends, and corners of gypsum board. Fasten outward from center or field of each board; drive fasteners straight and snug with heads dimpling (slightly below) board surface without breaking paper.
 - 8. Fit gypsum board snugly into steel door frames; no joints to occur within 12 inches of the corner of door frames, except at intersecting walls.
- B. Full Height Partitions: For interior rated partitions which are full height to structure above, cut gypsum board 1 inch shorter than the total height of wall to allow for unrestrained vertical movement, and attach to metal studs. .
- C. Where recessed fixtures or accessories are installed in rated partitions, install additional framing studs and 5/8 inch type "X" drywall behind recessed items to maintain required fire rating as detailed. Fill cavity with mineral fiber insulation.
- D. Use standard type drywall screws (Type S) for 20 gage or lighter framing members; where framing members are heavier than 20 gage, use tek type screws (Type S-12). For fire rated construction, use screws as specified for tested assembly.

- E. 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.
- F. 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. Do not make joints other than control joints at corners of framed openings.
- G. Form control and expansion joints with space between edges of adjoining gypsum panels.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. 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.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

- A. 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. Stagger end joints of the drywall not less than 4 feet. Fasten to cross tees or studs with 1-inch long Type S screws, spaced 12 inches on center in the field and 8 inches on center at butt joints.
 - 2. On non-rated partitions/walls, apply gypsum panels vertically (parallel to framing) or horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints. Span areas with single length boards where possible. Attach drywall with 1 inch screws, spaced not to exceed 12 inches on center in field and along vertical abutting edges.
 - 3. On one (1) hour rated partitions apply gypsum board with long dimension parallel to studs and attach with 1-inch long Type S screws to each side; space screws 8 inches on center along edges and 12 inches on center in the field of the board. Stagger all vertical joints on opposite sides of the assembly.
 - a. Install partition system in accordance with UL Design No. per Drawings.
 - 4. On braced cavity partitions, one (1) hour rated (single layer), apply gypsum board with long dimension parallel to the studs and attach with 1-inch long Type S screws, spaced 8 inches on center at vertical edges, 12 inches on center in the field and 8 inches on center at the runners.
 - a. Bracing specified in Section 092216 – Non-Structural Metal Framing Assemblies.
 - b. Install partition system in accordance with UL Design No. per Drawings.
 - 5. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - 6. Metal furred walls, interior side of exterior walls, and partitions scheduled for gypsum board one side: Apply as specified in paragraph Partitions, Non-Rated, Single Layer.
 - 7. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLATION OF 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. Install metal accessories where required. Use longest practical lengths, with no piece less than 2 feet long for continuous runs greater than 8 feet.
- C. Control Joints: Install control joints in accordance with ASTM C840 and in specific locations approved by Architect for visual effect.
 - 1. Do not run panels continuously through control joints; provide 1/2 inch maximum break in panels and install double stud framing at joints in panels as detailed on drawings. Square cut end joints to be butt together and align for neat fit.
 - 2. At typical non-rated partitions, apply a bead of acoustical sealant in joints between panels.
 - 3. At typical rated partitions, install two (2) layers of 5/8 inch type "X" drywall to inside portion of double studs to maintain fire rating as detailed; refer to USG standard details for 1-hr and 2-hr assemblies.
 - 4. Attach control joint to face panels with staples at 6 inches on center along each flange. Remove protective tape after joint treatment application. Install at following locations:
 - a. Walls of dissimilar construction meeting and remaining in the same plane.
 - b. Expansion or control joints occurring in building structure.
 - c. Wall runs exceeding 30 feet. Verify locations with Architect, except as otherwise indicated.
 - d. Ceiling exceeding 2500 sq ft; runs exceeding 50 feet in either direction, and wherever ceiling framing or furring changes direction.
- D. Interior Trim: Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed. Install in the following locations:
 - 1. Cornerbead: Use at all vertical and horizontal outside corners unless otherwise indicated.
 - 2. LC-Bead: Use at exposed panel edges and at transition between drywall and another surface material such as tile or wood.
 - 3. L-Bead: Use where work is tightly abutted to other work and where indicated on Drawings.
 - 4. U-Bead: Use where indicated on Drawings.
 - 5. Curved-Edge Cornerbead: Use at curved openings.
- E. Exterior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners.
 - 2. LC-Bead: Use at exposed panel edges.
- F. Aluminum Trim: Install in locations indicated on Drawings. Where feasible, use same fasteners to anchor trim flanges as required to fasten gypsum base to supports. Space fasteners not to exceed 6 inches on center; do not use fasteners which cannot be fully concealed by joint treatment applied over flanges. Joints between individual sections shall be hairline type. Comply with taping and finishing requirements for tapered edge as indicated.

3.5 FINISHING OF 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. Moisture Testing: Prior to finishing, taping and sanding, measure and document wallboard surface moisture content as follows:
 - 1. Perform moisture readings in two (2) locations on each wall; one (1) at bottom edge and one (1) half-way between floor and ceiling.
 - 2. Do not apply finishing to any substrate which exceeds one of the following moisture content readings:
 - a. Using Gypsum Moisture Meter: 0.4%
 - b. Using Wood Meter: 12%
- C. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- D. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- E. Gypsum Board Finish Levels: Finish panels to levels indicated below and in accordance with ASTM C840. All joints and angles shall have tape embedded in joint compound and have number of separate coats of joint compound over all joints, angles and fastener heads; accessories corresponding to Level of finish in indicated in Finishing Schedule below. Adhere to minimum drying times for joint compound to prevent joint failure, delayed shrinkage, ridging, etc. as recommended in NWCB Field Technical Information 303 "Gypsum Wallboard and Winter Weather" for all seasonal applications.
 - 1. All drywall finishing, including sanding, shall be carried down to floor level.
 - 2. Drywall finishing from a point of 3 inches above the ceiling line up to the structure may be fire taped, where completely concealed from view.
 - 3. Level 1: Non-fire-rated and non-smoke-rated assemblies ceiling plenum areas, concealed areas, no paint finish schedule, in unfinished tenant spaces and where indicated.
 - 4. Level 2: Gypsum board above finished ceiling, panels that are substrate for tile, panels that are substrate for wall panel systems and where indicated.
 - 5. Level 3: Gypsum board in utilitarian rooms as mechanical/electrical room, storerooms, janitor's closets, except behind ceramic tile, blade second coat smooth.
 - 6. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Refer to APPLICATION OF SKIM COAT AND LATEX PRIMER (LEVEL 4 FINISHES).
 - b. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
 - 7. Level 5: Gypsum board at all accent walls with color and other locations noted on plans.
 - a. Refer to APPLICATION OF SKIM COAT AND LATEX PRIMER (LEVEL 4 AND 5 FINISHES).
 - b. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- F. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- G. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.
- H. Cementitious Backer Units: Finish according to manufacturer's written instructions.
- I. Taping:
 - 1. Apply a uniform layer of taping compound to all joints and angles to be reinforced.
 - 2. Apply reinforcing tape immediately centered over the joint and seated into the compound.
 - 3. Skim coat shall follow immediately but shall not function as a fill or second coat.
 - 4. Tape shall be properly folded and embedded in all angles to provide a true angle.
- J. Filling:

1. After taping compound has hardened, apply topping compound, filling the board flush with the surface.
2. Fill coat shall cover the tape and feather out slightly beyond the tape.

K. Finishing:

1. Fastener Depressions and Accessories: Apply taping compound to all fastener depressions followed, when hardened, by at least the number of coats of topping compound for level indicated; leaving all depressions level with plane of the surface.
 - a. Level 2: One (1) coat of compound.
 - b. Level 3: Two (2) coats of compound.
 - c. Level 4: Three (3) coats of compound.
 - d. Level 5: Same as level 4.
2. Joints And Interior Angles: Apply taping and taping compound to all seams and interior angles followed when hardened by at least number of coats to topping compound for level indicated; leaving all depressions level with plane of surface.
 - a. Level 1: Tape embedded on compound.
 - b. Level 2: Tape embedded in compound. with thin coat of compound over tape and one coat over fastener Heads
 - c. Level 3: One separate coat of compound over level 2.
 - d. Level 4: Two (2) separate coats of compound over level 2.
 - e. Level 5: Same as level 4.
 - f. At least one separate coat of joint compound over interior angles.
3. Apply taping compound to all exposed corners of beads and trim, feathering out from the ground to the plane of the surface as specified for joints.
4. Finish joints with at least two (2) coats of topping compound, each coat extending beyond preceding coat. Feather joints to 6 inches each side of the joint; feather joints at square edges or butt ends of boards 12 inches each side of the joint.
5. All coats of joint compound shall be sanded after each application has dried. Exercise care when sanding to avoid roughing the board face paper. For final sanding, use 150 grit or finer sandpaper. Provide a smooth surface with joints fully concealed.

3.6 APPLICATION OF SKIM COAT AND LATEX PRIMER (WALLS AND CEILINGS)

- A. Level 3 and 4 Finish Designated Substrates: Apply one (1) full coverage coat of specified (40% solids) latex primer over gypsum board surfaces to receive finish painting.
 1. Apply drywall latex primer evenly using roller at an approximate coverage rate as recommended by the manufacturer and to achieve a "smooth wall", free from surface blemishes, irregularities holidays, sags, etc.; apply coat to a minimum of 350 square feet per gallon. Do not thin material.
 2. Use rollers of a type as recommended by the primer manufacturer. Back-roll primer if applied by spray. Apply additional coat to surfaces that have been damaged.
- B. Level 5 Finish Designated Substrates: Trowel apply a thin skim coat of joint compound over the entire surface and remove excess compound, shearing off and leaving a film of skim coat compound completely covering the paper and joints per ASTM C840.
 1. Exercise care when applying skim coat to eliminate laps or tool marks. If required, lightly sand surface to assure a smooth and even surface.
 2. After skim coat has thoroughly dried, apply separate coat of roller applied drywall latex primer as specified for Finish Levels 3 and 4, above.
 3. Contractor's Option: At Contractor's option the high build (60%) spray applied, drywall latex primer may be used, in lieu of, combination skim coat compound and roller applied latex primer above.
- C. Level 5 Finish Plus (Under High Gloss and Semi-Gloss Paints, Deep Tone Colors and Light Critical Areas Indicated):

1. Skim Coat Compound: Trowel apply a thin skim coat of joint compound over the entire surface and remove excess compound, shearing off and leaving a film of skim coat compound completely covering the paper and joints per ASTM C840.
2. Drywall Latex Primer: Apply one (1) full coverage coat of high build (60% solids) drywall latex primer over dried skim coat compound surfaces to receive finish painting.
 - a. Coverage Rate: Apply primer evenly using spray equipment at an approximate coverage rate of 100 to 125 square feet per gallon as to achieve recommended wet (WFT)/dry film thickness (DFT) as specified.
 - b. Application Method: Apply using crosshatch spray application method (first left to right, and then back over in an up and down spray pattern as recommended by the manufacturer and to achieve a "smooth substrate", free from surface blemishes, irregularities holidays, sags, etc. Do not thin material.

3.7 FIELD QUALITY CONTROL

- A. Inspection After Primer Application:
 1. Upon completion, inspect all gypsum board surfaces for any signs of defects which could affect the finish appearance (i.e. joint banding, flashing, photographing, uneven texture, etc.). Correct all defects.
 2. Should defects become visible after first coat of paint, installed as part of work Level 4 and 5 finishes and applied as part of work under Section 099000 – Painting and Coatings, the gypsum board installer shall be required to correct all such affected areas as directed at no additional cost to Owner.
- B. Finish Tolerance for Short Panels (Columns and Walls): Using a straight edge (horizontally) anywhere on wall surface, substrate shall not vary more than 3/16-inch when measured between corner beads, along entire span, up to 4-ft. long.

3.8 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

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Special Ceiling custom metal batten and framing systems.
 - a. Interior Systems:
 - 1) **SC-01**: Aluminum battens on track system
- B. Related Sections:
 - 1. 018119 – Indoor Air Quality Management Plan: (IAQ) goals and performance testing.
 - 2. 092216 – Non-Structural Metal Framing: Support framing.
- C. Substitutions: Substitute products will be considered only under terms and conditions specified in Section 012500 – Product Substitution Procedures.

1.2 SUBMITTALS

- A. Shop Drawings: Show fabrication and installation layouts of aluminum ceiling battens; details of edge conditions, joints, perforations, batten profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish among factory-, shop and field-assembled work.
 - 1. Show adjacent construction assemblies.
- B. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
 - 1. Aluminum battens: full size batten for each batten type. Include fasteners, closures, and other batten accessories.
 - 2. Trim and Closures: Include fasteners and other exposed accessories.
 - 3. Accessories: Samples for each type of accessory.
- C. Design Data: For aluminum batten assembly indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation, licensed in the State of Washington

1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Preformed ceiling battens and trim members shall be fabricated by Firm who has fabricated crafted sheet metal work for not less than five (5) years that has resulted in construction with a record of successful in-service performance. All battens shall be precision roll formed, pre-finished and be obtained from a single manufacturer.
- B. Installer's Qualifications: Installer must be approved by the batten fabricator for issuance of extended warranty.
- C. Quality of Finish: Where touch-up painting is allowed at damaged areas, the finish appearance must be acceptable to the Architect and Owner's Representative.

1.4 DELIVERY, HANDLING & STORAGE

- A. General: Comply with requirements specified in Section 016000 – Product Requirements.
- B. Protective Film: Ship materials with strippable film over exposed to view surfaces. Remove strippable film prior to installation.
 - 1. In all cases, after protective film has been removed there shall be no signs of film adhesive, damage to battens, or any other imperfections which affects the appearance.
 - 2. Do not allow the strippable film to remain on in extreme heat, cold, or in direct sunlight or other UV source.
- C. Delivery: Deliver battens and other components so they will not be damaged or deformed. Package battens for protection against damage during transportation, handling, and storage. Provide non-abrasive packaging material between battens to prevent damage.
- D. Handling: Exercise care in unloading, storing, and erecting ceiling battens to prevent bending, warping, twisting, and surface damage.
- E. Protection: Protect battens by methods approved by the manufacturer.
 - 1. In all cases, store in a manner to prevent water and/or condensation from being trapped between battens. If bundles become wet, sheets must be separated, wiped clean with a clean cloth and placed so that air circulation can complete the drying process. Wet storage staining of battens shall be cause for rejection by the Architect or Owner's Representative.
 - 2. Do not apply tape to face surface of any batten.
- F. Coordination:
 - 1. Coordinate timing of installation with other trades and other work to avoid schedule interference or damage to wall battens and associated materials.

1.5 PROJECT CONDITIONS

- A. Verification of Measurements: Before fabrication, verify all measurements at the job site to ensure proper fit and design the system to accommodate specified erection tolerances. Allow sufficient time for taking accurate field measurements so that fabrication and installation are within construction schedule.

PART 2 - PRODUCTS

2.1 MATERIALS AND SYSTEMS

- A. Interior Metal Batten Ceiling: refer to finish schedule in drawings for manufacturer and product information.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Examine support framing system to ensure that the system is securely anchored and properly aligned so as to provide a flat plane for the installation of the battens. Commencement of work constitutes acceptance of conditions.

3.2 INSTALLATION

- A. Battens: Install battens in continuous lengths; orientation as indicated. All battens installed per manufacturer's recommendation.

3.3 CLEANING

- A. Cleaning: Upon completion of work, clean surfaces free of dirt and stains. Cleaning shall be in accordance with coating manufacturer's recommendations. Where doubt exists as to suitability of cleaners, make spot tests before proceeding.

3.4 REPAIR AND TOUCH-UP

- A. Touch Up: Field touch-up shall be limited to repairing minor abraded or scratched surfaces. Repair minor scratches and blemishes with coating manufacturer's recommended products or system. Such repairs shall match the original finish for color and sheen and shall adhere to original finish when tested as per AAMA 2605. Touch-up work must be approved by the Architect and Owners.

3.5 PROTECTION

- A. General: Institute protective measures required throughout the remainder of the construction period to ensure that ceiling system will be without damage or deterioration at time of acceptance.

END OF SECTION 095400

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Carpet tile and Walk-off mat tile and accessories where scheduled. Carpet tile (CPTT-#).
 - 1. Refer to Field Quality Control requirements at end of this Section for ventilation for commercial spaces.
 - 2. Moisture and pH testing as specified in related sections.
- B. Related Sections:
 - 1. 018119 – Indoor Air Quality (IAQ) Requirements
 - 2. Refer to Finish Legend sheets in the drawing set for technom designations and specific information about finish materials as color, model, dimension and manufacturer.

1.2 SUBMITTALS

- A. Layout Drawings: Submit floor plans showing layout and placement of carpet tiles at 1/8 inch scale. Indicate various colors and pattern direction, start points, and locations and types of edge transition strips. Indicate columns, doorways, enclosing partitions, built-in cabinets and locations where cutouts are required in carpet tile. Provide base pattern repeat and overall dimensions. Layouts to include installation method as recommended by manufacturer.
- B. Product Data:
 - 1. Submit carpet tile manufacturer's material specification and installation instructions, including preparation of substrate and recommended releasable adhesive.
 - 2. Submit data on edge moldings, transitions trims and standard color options.
- C. Moisture Tests Results: Submit diagram of the area receiving carpeting showing location and results of each test; indicate time and date of each test, coordinate with Section 03 33 50 – Interior Floor Slab Requirements.
- D. Certification: Submit written certification in accordance with requirement in Quality Assurance from carpet tile manufacturer and supplier and installer, certifying the following:
 - 1. Carpet tile installer is a certified installer of carpet tile manufacturer's specified materials.
 - 2. Carpet tile materials and construction provided under this Section meets or exceeds requirements specified, including static control, flammability properties, and IAQ - odor emissions and pre-conditioning requirements.
 - 3. Provide written letter of acceptance from the carpet manufacturer or his representative stating that the moisture and pH tests results are within acceptable limits to warrant installation of flooring materials.
- E. Samples for Initial Selection:
 - 1. Transition Strips: Submit manufacturer's standard color ring to the Architect showing full range of standard colors available for selection by the Architect.

2. Edge transitions: submit 6 inch long sections of edge molding in each color and type required.
- F. Warranty: **All warranties shall be non-prorated and lifetime in duration.**
 1. Draft: Submit draft of product and installation warranties: provide all material and labor warranty information and requirements for compliance warranty for review.
 2. Executed Warranty: Submit for each carpet type; include installation warranties in "Warranties and Bonds Manual" specified in Section 01 78 00 – Closeout Submittals.
- G. Operation and Maintenance Data: Submit manufacturer's data on each type of carpet tile used, including colors; submit recommended maintenance instructions and methods and cleaning frequencies for each type of carpet, including precautions against materials and methods detrimental to carpet performance; include all data in "Materials and Finishes Maintenance Manual" specified in Section 01 78 00 – Closeout Submittals.
- H. Contractor to initiate discussion with Milliken Floor Covering regarding its N/XT Life Circularity Program. Additional information at: <https://www.milliken.com/en-us/businesses/floor-covering/mpact-our-planet/nxt-life>

1.3 QUALITY ASSURANCE – PRODUCT REQUIREMENTS

- A. Single Source: Obtain each type of product required, including adhesives and accessories from one manufacturer throughout the Project.
- B. Installer's Qualifications: Engage an experienced Installer, certified by the Floor Covering Installation Board, with not less than 5 consecutive years of experience in installation of commercial carpeting tile of type, quantity and installation methods similar in material, design, and extent to that indicated for Project. Installer must have experience (within past 5 years) in similar size facilities utilizing installation methods similar to this project.
 1. Special Requirement: Flooring installer shall be certified by the respective carpet tile manufacturer for applications indicated. Submit evidence of written certification in accordance with Submittal requirements.
- C. Flame/Smoke Resistance Standards: Provide carpet tile which has been tested and passes the following test standards:
 1. Flammability: Comply with one of following:
 - a. Pill Test: Test for flammability; ASTM D 2859, or DOC FF-1-70.
 - b. Floor Radiant Panel Test: Test for burning under varying radiant energy levels; ASTM E 648, with minimum average radiant flux ratings not less than 0.45 watts/sq.cm (NFPA 253, Class 1).
 2. Smoke Density Test: Test in radiant heat chamber, with and without flame, for density of smoke generated; ASTM E 662, or NFPA No. 258, also known as NBS Smoke Density Chamber Test, less than 450.
- D. Fade and Stain Resistance: Provide only carpet tile whose manufacturer will guarantee that carpet base color and pattern or print colors shall meet the following minimum requirements:
 1. Light fastness - minimum rating of 4.0 after 60 AFU's, test AATCC-16E.

2. Crocking - minimum ratings of 4.0 for wet, dry and solvent crock test, AATCC-8.
 3. Cold Water Bleed - minimum rating of 4.5 change scale rating, test AATCC-107.
 4. Ozone and Gas - test AATCC-129.
 5. GSA Permanent Stain resistance test – must pass AATCC 175 after 100 revolutions on the Taber Abrader. Passing rating must be no less than 8.0 (10.0 is best) on the AATCC Red 40 Stain Scale.
- E. Static Resistance: Provide carpet tile that will maintain static generation of less than 3.5 KV at 70 degrees F and 20% Relative Humidity as measured by AATCC-134-75 (Standard Shuffle Test) throughout the life of the carpet.
- F. Indoor Air Quality (IAQ) - Odor Emissions: Carpet types, including cushion (as applicable) and adhesives must have been tested and passed the Indoor Air Quality (IAQ) Carpet “Green Label” Testing Program of the Carpet and Rug Institute (CRI). All materials shall bear CRI-IAQ “Green Label PLUS”, and comply with the following requirements for total emissions as determined in accordance with ASTM D5116 – Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products:
1. Carpet, Including Cushion Backing: Volatile Organic Compound (VOC’s) must not exceed following:
 - a. Total VOC’s: 0.5 mg/sq. m x h.
 - b. 4-PC (4-Phenylcyclohexene): 0.05 mg/sq. m x h.
 - c. Formaldehyde: 0.05 mg/sq. m x h.
 - d. Styrene: 0.4 mg/sq. m x h.
 2. Adhesives: Volatile Organic Compound (VOC’s), per South Coast Air Quality Management District Rule #1168, must not exceed following:
 - a. Total VOC’s: 10.00 mg/sq. m x h.
 - b. Formaldehyde: 0.05 mg/sq. m x h.
 - c. 2-Ethyl-1-Hexanol: 3.00 mg/sq. m x h.
- G. Dimensional Stability: Provide only carpet tile that will continue to lie flat with no edge curling or cupping when properly installed and maintained per manufacturer’s requirements.
- H. TARR Rating: Carpet Tile products to meet or exceed a rating of 3.5/Severe. Confirm carpet product compliance during product data submission.
- I. Face Distortion: Traffic patterns associated with crushing and matting, as well as soiling. Provide only carpet that meet the following minimum requirements.
1. Face Distortion:
 - a. CRI TM101 Assessment of Carpet Surface Appearance Change
 - b. CRI Carpet Appearance Retention Grading Scales.
 2. Average pile yarn density:
 - a. Calculate per protocol of UM-44d
 3. ASTM D6540-12 Standard Test Method for Accelerated Soiling
 - a. Minimum rating of 3
- J. Pre-installation Conference: Conduct conference at Project site with Contractor, carpet Installer, carpet representative and Architect to review methods and installation procedures related to each carpet type, including, but not limited to, the following:
1. Review delivery, storage, and handling procedures.

2. Review installation schedule, Owner's restrictions and sequencing of carpet types.
3. Review installation procedures specific to room layout, terminations and cutouts for electrical floor access covers, etc..
4. Review ventilation procedures, as may be required to meet Indoor Air Quality (IAQ) - Odor Emissions.

1.4 DELIVERY, STORAGE & HANDLING

- A. General: Comply with requirements specified in Section 01 60 00 – Product Requirements.
- B. Deliver carpet tile to site in manufacturer's original packages clearly labeled with manufacturer's name, brand, size, and related information. Upon receipt of materials, inspect for in-transit damage and replace if necessary.
- C. Store in dry, clean, well ventilated space; protect from damage, soiling, fading and moisture.

1.5 PROJECT CONDITIONS

- A. Environmental Conditions: Maintain temperatures in space in accordance with carpet or adhesive manufacturer's recommendations, but in no case less than 65 degrees or above 95 degrees F. with a maximum relative humidity of 65%. If ambient temperatures are outside these parameters, Contractor shall not begin until HVAC system is operations and temperature and humidity parameters are maintained at least 48 hours before, during and for 72 hours after completion of work.
- B. Precondition: All carpet tile shall be stored in a room on site 48 hours prior to actual installation with the room preconditioned at a minimum of 65 degrees F. with humidity between 35 to 65 percent.

1.6 SEQUENCING AND SCHEDULING

- A. Install carpet tile after other finishing operations, including painting have been completed to ensure that installed carpet tiles are not damaged, soiled, or stained.
- B. Do not install carpet tile until concrete slabs are sufficiently dry to bond with adhesive. Perform bond and moisture tests in accordance with Section 033350 Interior Floor Slab Requirements, or other third party testing procedure recommended by carpet manufacturer to verify that concrete surfaces are dry and ready to receive carpet, and that adhesive is totally compatible with the substrate.
- C. Installation Schedule: Confirm scheduling parameters with contractor and facility coordinators.

1.7 WARRANTY

- A. Special Warranty: Provide special warranty, signed by Contractor, Installer, and Manufacturer, agreeing to repair or replace defective materials during 10-15 year period following date of Substantial Completion. Warranty shall also cover workmanship for a period of two years from the date of Substantial Completion.
- B. Lifetime Warranties: Submit carpet manufacturer's written non-prorated lifetime warranty, except as otherwise indicated, for each carpet type, agreeing to furnish FOB project site replacement carpet which exhibits any of the following product defects:

1. Wear: No more than 10% face yarn loss by weight in normal use.
2. Static: No change in specified performance.
3. Edge Ravel/Tuft Bind: No edge ravel or loss of adhesion to backing, wet or dry in normal use (no seam sealers required).
4. Dimensional Stability: No change in appearance, including cupping, doming or dishing.
5. Adhesive: No loss of adhesion to floor in normal use.
6. Stain Resistance: Manufacturer's lifetime warranty, including 10 year warranty for Light fastness and Atmospheric Contaminant with use of specified fiber technology system.

1.8 MAINTENANCE STOCK

- A. Extra Tiles: After completion of work, deliver to Project site, at a location designated by Owner, provide replacement materials from same manufactured lot as materials installed. Package extra materials in manufacturer's original unopened cartons and clearly label. Furnish 10% extra carpet tiles of each pattern and color installed. Provide overage expectations for each carpet type to contractor and facility beyond the extra tile quantities noted for Extra/Attic stock.

PART 2 - PRODUCTS

2.1 CARPET TILE PRODUCT, PERFORMANCE, AND MANUFACTURERS

- A. Refer to drawings for selected manufacturer, products, locations and extents of all carpets

2.2 INSTALLATION MATERIALS

- A. Adhesives: Waterproof, non-staining, non-flammable, "Green Label" pressure sensitive (releasable) carpet adhesive as recommended by carpet manufacturer for compatibility with carpet backing with existing and new substrate conditions. Adhesives shall meet EPA, VOC's requirements and qualify for NFPA and CBC Class A fire ratings as determined by ASTM E84.
- B. Underlayments and Patching Compounds: Refer to Section 033350 Interior Floor Slab Requirements.

2.3 ACCESSORIES

- A. Rubber Transition Strips: Types as follows manufactured by Tarkett/Johnsonite or approved equal. Exact depth of transition strips shall accommodate actual thickness of carpet. Colors as selected by the Architect from manufacturer's full range of standard colors.
- B. Metal transition strips at amenity areas carpet to concrete:
 1. As described in the Finish Legend sheets in the drawings
- C. Protection Paper: Fortifiber Corporation "Seekure 892", Surface Shields Incorporated "Carpet Shield". Holland Manufacturing "Grade 3518-reinforced Kraft Paper" or approved heavy, reinforced, non-staining Kraft laminated paper.
- D. Miscellaneous Materials: As recommended by manufacturers of carpet tile; and selected by Installer to meet Project requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Examine areas where installation of carpet tile will occur with Installer present. Verify that substrates and conditions are satisfactory for installation and comply with carpet tile manufacturer's requirements and those specified in this Section. Do not proceed with installation in areas of discrepancy until such discrepancies have been fully resolved. Commencement of work constitutes acceptance of sub-floor conditions.

3.2 PREPARATION

- A. Concrete: Remove all dirt, oil, grease, and other contaminants affecting bond. Vacuum surfaces thoroughly using industrial power vacuum immediately before installation. If necessary, damp mop floors with warm water. After cleaning, inspect substrate for visual evidence of moisture, alkaline salts, or dust.
 - 1. Verify that slab substrates are free of materials which would interfere with bonding of adhesive. See Section 03 01 50 – Floor Repair for repair of unacceptable floor conditions.
 - 2. Vacuum surfaces thoroughly using industrial power vacuum immediately before installation.
 - 3. Fill minor holes, cracks, and transition areas with an approved latex-type underlayment. Trowel-on to smooth surface and allow to fully dry before applying carpet tile. Consult underlayment manufacturer's directions for drying times and other special requirements.
 - 4. Comply with any additional instructions and recommendations of carpet and adhesive manufacturers for proper floor preparation.
 - 5. Seal powdery or porous surfaces with sealer recommended by carpet manufacturer. If required, apply according to manufacturer's directions.
- B. Moisture Tests: Determine moisture content and Ph levels of surfaces by performing appropriate tests. Do not apply materials over surfaces where moisture content exceeds that permitted by the tile carpeting manufacturer.
 - 1. Subject to flooring manufacturer's approval, and type of under slab vapor barrier on grade, perform respective testing indicated in Section 033350 – Interior Floor Slab Requirements.
 - 2. If moisture and Ph levels are acceptable with tile carpeting manufacturer, proceed with installation of materials. If test results exceed limitation, do not proceed with flooring installation until corrective action has been completed.

3.3 INSTALLATION (GENERAL)

- A. General: Comply with Carpet and Rug Institute "Standard for Installation of Commercial Textile Floor Covering Materials (CRI 104, Section 14 'Carpet Modules' current edition)", and manufacturer's instructions and recommendations for installation of carpet by the full spread of pressure sensitive adhesive glue down method, except where more stringent requirements are shown or specified.
 - 1. Patterns: Carpet tile shall be installed in patterns as indicated in locations shown in

Finish Schedule and on drawings. Cut carpet evenly and accurately to fit neatly at walls, columns, and projections.

2. Installed carpet shall be free from ripples, ravel, frays, puckers and raw exposed edges. All loop pile tile will demonstrate some fuzzy edges due to normal manufacturing conditions. It is the contractor's responsibility to trim all edges of tile to eliminate fuzzing at tile edges.
3. Extend carpet under open-bottomed obstructions and under removable flanges and furnishings, and into alcoves and closets of rooms indicated to be carpeted unless another floor finish is indicated for such spaces.
4. Provide cut-outs as indicated for removable access devices in substrate. Secure both sides of cuts to the substrate.
5. Install carpet edge guards where edge of carpet is exposed; anchor guards to substrate.
6. Do not bridge building expansion joints continuously with carpet tile, provide for movement.

3.4 CARPET INSTALLATION

- A. General: Measure the area to find the best starting point to utilize full width perimeter tiles.
- B. Joints: Install carpet tiles with snug seams. Continually check that modules and patterns are being placed together with correct and uniform firmness.
 1. Seam at doors, running parallel to doors, shall be centered directly under the closed door. Seams perpendicular to doors or entries are not acceptable.
 2. Check correct snugness by measuring the distance covered by 11 installed modules (10 joints). This distance should be in compliance with manufacturer's specifications for the particular product being installed.
 3. Care shall be taken not to trap yarn between modules.
- C. Applying Adhesive: Apply carpet manufacturer's approved adhesive over the entire surface using a paint roller. Begin at center or starting point and work outward to the perimeter until the entire surface is covered with adhesive. Begin installing carpet tiles only after adhesive has turned from opaque to clear. To check, it will not transfer when touched with a finger. Do not install carpet tile into wet adhesive.
 1. The chalk lines must be used as a guide for lining up the edges of modules. Using the pyramiding technique, install one quadrant at a time.
 2. The corners of the modules should be flat to assure proper fit. Modules should be installed snug, but not jammed. Be careful to not over-tighten the installation.
- D. Use the seam roller to blend and enhance the seams.
- E. Trimming: The loop pile modules will have some yarn blossoming at the edges, which is inherent to this type of construction. Installer is responsible to trim all modules exhibiting this condition.
- F. Rubber Transition Strips: Install where carpet tile terminates exposing the edge of the

material and where carpet tile terminates in doorway. Center reducers under doors. Bond reducers to substrate in straight, true lines.

3.5 CLEANING AND PROTECTION

- A. Clean-Up: On completion of installation, vacuum carpet using two motor, top loading, upright commercial machine with brush-only element, utilizing a high filtration dust bag. Remove spots in accordance with carpet manufacturer's guidelines and replace carpet where spots cannot be removed to the satisfaction of the Architect. Remove any protruding face yarn using sharp scissors. Be certain to trim any loose yarns or fibers at all seams.
- B. Protection: Following cleaning and vacuum carefully protect the carpeting from soiling and damage until final acceptance. Protection shall be accomplished by using specified building paper. Edges shall be lapped 6 inches and secured with non-asphaltic tape. Covering shall be kept in repair and damaged portions replaced during the construction and move-in period.

END OF SECTION 096813

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Textile wall coverings **(WC-01)**.
- B. Related Sections:
 - 1. 018119 – Indoor Air Quality (IAQ) Management Plans
 - 2. 092900 – Gypsum Board: Substrate preparation to Level 4, prior to wall covering installation.
- C. Substitutions: Substitute products will be considered only under terms and conditions specified in Section 012500 – Product Substitution Procedures.

1.2 SUBMITTALS

- A. General: Make submittals in accordance with Section 013300 – Submittal Procedures.
- B. Product Data: Submit manufacturer' technical data and installation instructions for each product.
- C. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern placement, seams and termination points.
- D. Provide graphic artwork and layout for review.
- E. Samples for Verification: Submit full width samples 24 inches long, minimum, or length required to shown complete repeat of each color of wall covering proposed for use.
 - 1. Provide a representative sample of partial printed wall graphic.
- F. Manufacturer's Certificate: Submit manufacturer's certification that materials furnished comply with requirements specified.
- G. Operation and Maintenance Data: Submit manufacturer's recommended maintenance instructions and procedures; include data in "Materials and Finishes Maintenance Materials" specified in Section 017800.

1.3 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Fire-Test-Response Characteristics: Provide wall coverings and adhesives with the following fire-test-response characteristics as determined by testing identical products applied with identical adhesives to substrates per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Surface-Burning Characteristics: As follows, per ASTM E 84 Test Method for Surface Burning Characteristics of Building Materials:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.

- B. (IAQ) Product Qualifications: Certified by Greenguard Indoor Air Quality Standard for Low Emitting Products, or meet or have lower emission limits of Greenguard Certification Program listed products for acoustical subsurface and fabric materials used for acoustical wall and ceiling panels and which will not result in air concentrations greater than following:
1. Total VOCs: 0.5 mg/m³
 2. Formaldehyde: 0.05 ppm
 3. Total Aldehydes: 0.1 ppm
 4. 4-phenylcyclohexene: 0.0065 mg/m³
 5. Additional Requirements:
 - a. Any pollutant not listed must produce an air concentration level no greater than 1/10 the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, Cincinnati, Ohio 45211-4438).
 - b. Any pollutant regulated as a primary or secondary outdoor air pollutant must meet a concentration that will not generate an air concentration greater than that promulgated by the National Ambient Air Quality Standard (U.S. EPA, code of Federal Regulations, Title 40, Part 50).

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install wall coverings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained, before, during and after installation at levels indicated for Project when occupied, however, in no case shall the area temperature be less than 50 degrees F. during a period of 72 hours before, during and 48 hours after installation.
- B. Lighting: Do not install wall covering until a lighting level of not less than 15 fc, or a permanent level of lighting is provided on the surfaces to receive wall covering.
- C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.
- D. Remove wall covering from its packaging and allow to acclimatize to the area of installation 24 hours before application.

1.5 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with requirements specified in Section 016000 – Product Requirements.
- B. Deliver in original unopened packages or containers with manufacturer's labels and testing laboratory certification of fire hazard classification intact on each package. Provide adequate wrapping or other protection as required to prevent damage during shipment, handling and storage.
- C. Store materials in a clean, dry storage area with temperature maintained above 55 degrees with normal humidity. Do not cross stack the material.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace or repair graphic vinyl wall covering that fails in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to the following:
 - a. Discoloration from UV
 - b. Delamination
 - c. Wall covering sagging, distorting, or releasing from wall.
 - d. Warping of core.
 - 2. Warranty Period: Five years from date of Substantial Completion.
 - 3. Warranty against defective workmanship: One year from date of Substantial Completion

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Refer to Finish Schedule for manufacturer and product information.
- B. Adhesive(s): Mildew-resistant, non-staining, strippable adhesive, for use with specific wall covering and substrate application, as recommended in writing by wall-covering manufacturer, and with a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Primer: Mildew-resistant, wall cover primer recommended by wall covering manufacturer which allows removal of covering without damage to paper faced substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates scheduled to receive wall covering for conditions that will adversely affect execution and quality of work. Do not proceed with application in areas of discrepancy until all such discrepancies have been fully resolved. Commencement of work constitutes acceptance of surfaces.

3.2 PREPARATION

- A. General: Remove dirt, or other similar markings to prevent color staining or bleed through or bond of the wall covering.
- B. Remove switch plates, wall plates, and surface-mounted fixtures in areas where wall covering is to be applied.
- C. Level Of Wall Finishing: Prepare in accordance with Level 4 as required in Section 092900 – Gypsum Board.
- D. Prime wall surface as required by manufacturer's instructions in order to permit ultimate removal of wall covering without damaging paper facing of drywall. Allow sufficient time for release coat to fully dry and cure.

3.3 APPLICATION

- A. General: Apply wall covering in strict accordance with manufacturer's written instructions and the requirements specified herein. Place wall covering panels consecutively in exact order they are cut from the roll. Use rolls in consecutive numerical sequence of manufacturer.
- B. Apply adhesive uniformly to back of wall covering and to wall surface using a roller or paste brush in accordance with the manufacturer's instructions. Follow the manufacturer's printed instructions for mixing adhesive.
- C. Install seams vertically and plumb; no horizontal seams permitted. Double-cut to ensure tight joints, unless otherwise recommended by the wall covering manufacturer. Wrap wall covering 6 inches beyond inside and outside corners. Extend edges not less than 1/2 inch behind applied base and trim. Cut wall covering evenly to the edges of wall penetrations.
- D. Use stiff bristled brush, roller or flexible broad knife to remove air bubbles, wrinkles and other defects. Finish surface shall be smooth, without wrinkles, gaps, overlaps or tears.
- E. Remove excess adhesive along each seam as it is made using warm water and sponge. Dry with a cloth towel.
- F. Replace removed plates and fixtures; verify cut edges of wall coverings are completely concealed.

END OF SECTION 097200

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Acoustic stretched fabric (**ASFW-##**) on existing track mounted, site fabricated acoustical wall panel assembly.
- B. Related Sections:
 - 1. 018119 – Indoor Air Quality Requirements
 - 2. 092116 – Gypsum Board Assemblies
- C. Substitutions: Substitute products will be considered only under terms and conditions specified in Section 012500 – Product Substitution Procedures and must be formally approved by RWS/DEV team.

1.2 REFERENCES

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials: Surface-burning characteristics of fabrics not attached to substrate, as well as applying to other materials of the assembly, or the whole assembly.
- B. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- C. ASTM D5034-1 - Standard Test Method for Testing Breaking Loads of Textiles in a Holding Fixture
- D. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films: This test normally applies for textiles not directly applied to a substrate.

1.3 SUBMITTALS

- A. General: Make submittals in accordance with Section 013300 – Submittal.
- B. Shop Drawings: For stretched-fabric wall system. Include mounting devices and details; seaming diagrams; details at head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate frame edge and core materials.
 - 1. Include elevations showing panel sizes and direction of fabric weave and pattern matching.
- C. Coordination Drawings: Show intersections with wall base, doors, electrical outlets and switches, thermostats, and other adjacent work.
- D. Samples for Verification: For the following products. Prepare Samples from same material to be used for the Work.
 - 1. Frame System: 12-inch- long Sample showing edge profile and corner.
 - 2. Core Material: 12-inch- square Sample.

3. Facing Materials: From each manufacturer for custom and standard textiles, provide dye lot and backing. Custom fabrics may require multiple lab dip samples to achieve final color approval.
4. Sample Panels: For each type including the facing material/textile installed on a backer. Utilize the framing profiles and system components including the core material. Facing material shall be approved prior to panel assembly. Size of panel to be a minimum 24-inches by 24-inches.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain stretched-fabric wall system through one source from a single manufacturer.
- C. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Section – 013100 Project Management and Coordination.
- D. Fire Retardant Classification: Class A, to ASTM E84.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with requirements specified in Section 016000 – Product Requirements
- B. Comply with fabric and stretched-fabric wall system manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- C. Deliver materials in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install stretched-fabric wall systems until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install stretched-fabric wall systems until a lighting level of not less than 50 fc is provided on surfaces to receive stretched-fabric wall systems.
- C. Field Measurements: Verify dimensions by field measurements.

1.7 WARRANTY

- A. Provide a five-year manufacturer's warranty against material defects.

PART 2 - PRODUCTS

2.1 STRETCHED-FABRIC WALL SYSTEM

- A. Refer to drawings for technom designations, fabric and system descriptions

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fabric, substrates, blocking, and conditions, with Installer present, for compliance with requirements, installation tolerances, substrate finish, air infiltration, and other conditions affecting performance of stretched-fabric wall systems.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Acclimatize Fabric: Before installation, allow fabric to adjust to and become stable at ambient temperature and humidity of spaces where it will be installed.

3.3 INSTALLATION

- A. Install stretched-fabric wall systems vertical and plumb, unless otherwise indicated; true in plane; and with fabric installed square to the grain according to stretched-fabric wall system manufacturer's written instructions.
- B. Measure each area and establish layout of panels of sizes indicated on Drawings within a given area.
- C. Tightly fit framing to adjacent construction and securely attach to substrate according to stretched-fabric wall system manufacturer's written instructions.
- D. Provide framing around penetrations.
- E. Maintain sequence of fabric drops; match and level fabric pattern and grain.
- F. Sewn seams are not permitted.
- G. Install core material with full coverage, flush with face of stretched-fabric wall system track. Bond or fasten core material to substrate by method recommended in writing by stretched-fabric wall system manufacturer.
- H. Stretch fabric tight and square without puckers, ripples, or distortions. Acclimatize and restretch if recommended by stretched-fabric wall system manufacturer. Repair distortions, wrinkles, and sagging.
- I. Stretch and secure fabric to conceal fabric edges and so frame and frame attachment methods are concealed by fabric.
- J. Install fabric with patterns or directional weaves fabricated so pattern or weave matches adjacent panels.
- K. Construction Tolerances: As follows:
 - 1. Variation from Level and Plumb: Plus or minus 1/32 inch.
 - 2. Variation of Panel Joints from Hairline: Not more than 1/32 inch.

3.4 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.

- B. Clean face of fabric with method recommended by manufacture on completion of installation, to remove dust and other foreign materials according to manufacturer's written instructions.

3.5 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure that stretched-fabric wall system is without damage or deterioration at time of Substantial Completion.
- B. Replace damaged stretched-fabric wall system and fabric facing that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 098413

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: In general, the principal items of work include, but are not limited to, the following:
 - 1. Preparation of surfaces.
 - 2. Painting and finishing of all exposed-to-view interior surfaces, except as otherwise indicated or specified.
 - 3. Field painting of factory finished equipment is not required if such equipment is typically hidden from view.
 - 4. Apply one coat of flat black enamel to all ductwork and lining and to conduit or piping which can be seen through grilles, registers or diffusers, and to speaker enclosures behind speaker cloth; minimum 12 inches from view
 - 5. Touch-up paint all blemished or otherwise disfigured paint on all surfaces which occur prior to acceptance of the building by the Owner.
- B. Unless specifically mentioned in technical sections to receive factory finish, paint all these items occurring within the plane, the same as adjacent similar materials or areas. If finish is not designated, the Architect will select these from the materials systems specified.
- C. The following items do not require field painting:
 - 1. Pre-finished aluminum materials, including but not limited to the following:
 - a. Aluminum windows and entrances, and aluminum curtain wall components.
 - b. Aluminum entrance doors.
 - 2. Interior wall louvers and grilles.
 - 3. Preformed wall panels and associated flashing.
 - 4. Toilet partitions and other factory finished items.
- D. Related Sections:
 - 1. 014339 – Mock-ups
 - 2. 018119 – Indoor Air Quality (IAQ) Requirements
 - 3. 050513 – Shop-Applied Coatings for Metal
 - 4. 092116 – Gypsum Board Assemblies: Finishes
 - 5. 099600 – High Performance Coatings
 - a. Field-applied coatings for exterior metal surfaces, including exterior canopy structures.
 - 6. Refer to Finish Legend sheets in the drawing set for technom designations and specific information about finish materials as color, model, dimension and manufacturer.

1.2 DEFINITIONS

- A. Exposed Surfaces: The term “exposed surfaces” includes areas visible when permanent or built-in fixtures, covers, grilles, and similar components are in place. Extend painting in these areas as required to maintain the system integrity and provide desired protection.
- B. DFM (dry film mils): Minimum thickness, measured in mils (1 inch), of a coat of paint in the cured state.

- C. Gloss Levels: The following terms are used to specify specular gloss of finish coats in accordance with those listed by MPI (Master Painter Institute) when measured in accordance with ASTM D523.

Gloss Level	Description	Gloss @ 60 degrees		Sheen @ 85 degrees
Level 1	Traditional matte finish - flat	Maximum 5 units	and	Maximum. 10 units
Level 2	High side sheen flat – a 'velvet-like' finish	Maximum 10 units	and	10-35 units
Level 3	Traditional 'eggshell-like' finish	10-25 units	and	10-35 units
Level 4	'Satin-like' finish	20-35 units	and	Minimum 35 units
Level 5	Traditional semi-gloss	35-70 units		
Level 6	Traditional gloss	70-85 units		
Level 7	High gloss	More than 85 units		

1.3 SUBMITTALS

- A. Product Data: Submit complete list of products proposed for use, including technical data on each product to verify compliance; organize list to indicate painting systems to be used with each substrate.
- Submit paint list and arrange in same format as indicated in PART 4 – SCHEDULES with paint manufacturer, paint name, coverage and VOC content listed.
 - Submittal shall contain any proposed revisions to specifications (ie. surface preparation, method of application, etc.) which painting contractor feels are necessary in their execution of the Contract.
 - Any proposed revisions must be approved by the Architect prior to proceeding with the Work.
- B. Samples: Using approved paint products, prepare and submit samples of each type of finish, gloss level, and color for approval. Refer to article "Paint Colors" under PART 2 PRODUCTS for requirements. Label samples with color number, product name and date. Provide three (3) samples of each color and sheen.
- Prepare paint samples on 8-1/2 inch by 11 inch heavy, durable non porous paper.
 - Adjustments to the overall sheen in any one or more of the colors may be required. Such adjustments (if any) shall be made at no additional cost. Additional samples will be required should adjustments be made.
 - Initial color samples which have been approved are subject to final acceptance at time of field mock-up examination.
- C. Contract Closeout Submittal: Include the following at time of Project Closeout:
- Color Mix: Submit color mix formula for each required paint color. Mix formula must be in measured increments of 48ths of an ounce; include the manufacturer's color and number identification, color chip, location list where said colors were applied and paint manufacturer of base. Include data in "Materials and Finishes Manual" specified in Section 017800 – Closeout Submittals.

1.4 QUALITY ASSURANCE

- A. Single Source:
 - 1. To the maximum extent practicable, select a single manufacturer to provide all materials required by this Section, using additional manufacturers to provide systems not offered by the selected principal manufacturer.
 - 2. For each individual system, provide primer and other undercoat paint produced by same manufacturer as finish coat. Use only thinners approved by paint manufacturer and use only within recommended limits.
- B. Visual Standards: Each distinct area of the finished Work shall be free of variations in color and sheen, runs, sags, holidays, blistering, checking, cracking, scratches and other signs of poor workmanship. Deep tone and accent color walls shall be free from joint banding, flashing, photographing, and uneven appearance.
- C. Mockups: Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Wall: Provide two mockups, one each at the Center Hall North and South Walls as indicated in drawings
 - 2. Apply benchmark samples after permanent lighting and other environmental services have been activated.
 - a. If permanent lighting is not operational, provide temporary lighting of same color temperature (degrees K) for Architect's evaluation or the samples.
 - 3. Final approval of color selections will be based on benchmark samples.
 - a. If preliminary color selections are not approved, apply one additional benchmark sample of additional colors selected by Architect at no added cost to Owner. Include cost of 3 (first 2 plus one additional) samples at each indicated location.

1.5 DELIVERY, STORAGE & HANDLING

- A. General: Comply with requirements specified in Section 016000 – Product Requirements.
- B. Deliver materials to building in sealed, original, labeled containers bearing manufacturer's name, type of material, brand name, color designation, and instructions for mixing and thinning.
- C. Store materials when not in actual use in a place specifically assigned for that purpose which is dry and out of direct sunlight. Store materials in a manner so as not to exceed the manufacturer's temperature limitations.

1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Air temperature and substrate temperature and relative humidity shall be within the manufacturer's established limits. Do not apply exterior paint when the following conditions exist, unless requirements of paint manufacturers are more restrictive.
 - 1. Temperature: If surface and ambient temperature is above 90 degrees F, or below 50-degrees F.
 - 2. Weather: Do not apply paint in snow, rain, fog, when excessively windy or during mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

- B. Lighting: Do not proceed with work under this section unless adequate lighting is available. Provide lighting level of at least 50 candlepower per square foot, measured mid-height at substrate surface.
- C. Ventilation: Provide adequate ventilation as required for the type of paint and cleaning materials used. If necessary, consult paint manufacturer for recommendations.
- D. Protection: Protect surrounding areas against damage due to painting operations. At a minimum, surrounding areas shall be covered with polyethylene sheeting and waterproof masking tape. The Owner shall not be responsible for Contractor's selection or method of protection.
 - 1. Protective coverings shall be secured against wind and shall be vented to prevent collection of moisture on covered surfaces.
 - 2. Provide "wet paint" signs as required to protect newly painted surfaces.
- E. Precautions: Take all precautions to prevent fire; open containers of flammable materials only when needed; keep rubbing cloths and oily rags in tightly closed containers and remove from site daily. Dispose of hazardous materials in accordance with all local, State and Federal regulations.
- F. Coordination: Review other sections of this specification in which prime paints are to be provided to ensure compatibility of total coating system for various substrates. Notify Contractor in writing of any anticipated problems using specified coating systems with substrates primed by others.

PART 2 - PRODUCTS

2.1 PAINT MATERIALS

- A. Chemical Constituents: See Section 018113 – Sustainable Design Requirements for restricted chemicals for paints used within conditioned space of building.
- B. Manufacturers: Refer to Paint Schedule at end of this Section for manufacturer's product names and paint systems which are included to establish the required level of quality. Additionally, the following list of manufacture's are acceptable, contingent upon meeting level of paint quality indicated in PAINT SCHEDULE, and for which a substitution request is not required.
 - 1. Benjamin Moore & Co. Eco Spec
 - a. Purchased through Mallory Paint Store
 - 2. Sherwin Williams ProMar 200 Interior Latex
 - a. Purchased through CBRE Fusion Program
- C. Colors: Each paint color must be accurately mixed to ensure color continuity. No allowance will be granted for mis-matched paint of the same color when viewed under normal lighting conditions.
- D. Provide primer and finish coats which are compatible with each other and with prime coats provided under other Sections. Provide barrier coats over incompatible primers or remove and re-prime as required.

- E. Tint each undercoat a lighter shade than finish coat so that numbers of coats can be easily discerned. No color mixing will be allowed at the job-site.
- F. Thinner: Type as recommended by the paint manufacturer. Use thinner only when recommended by the paint manufacturer, and then only in a quantity as indicated on the label.
- G. Primers: Primers, except metal primers, shall be white in color for inspection purposes.
- H. Secondary Products: Secondary products not specified by name and required for the job such as shellac, oils, patching compounds, putty, etc., shall be "best grade" products.

2.2 PAINT COLORS

- A. General: Provide the paint colors as indicated in the Finish Schedule and which form the Basis of Design. Other manufacturer's products will be considered as a substitution, pending Architect's approval.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Examine surfaces to receive paint finish for conditions that will adversely affect execution, performance, or quality of work and which cannot be put into an acceptable condition through reasonable preparatory work as specified herein.
 - 1. Surfaces which are unfit to receive the work of this section shall be repaired, replaced or re-finished such that they are acceptable and such that the work of this section may be done as specified. It shall be the responsibility of the General Contractor to ensure that these provisions are strictly enforced.
 - 2. Commencement of Work constitutes acceptance of surfaces and conditions.
- B. Gypsum Wallboard: Inspect wall surfaces of gypsum drywall which are scheduled to receive deep tone and accent paint colors prior to application of paint for signs of defects which could affect the finish appearance (ie. banding, flashing, uneven texture, etc.)
 - 1. Initial Inspection: Make initial inspection a normal viewing distance (approximately 4 feet) under normal lighting conditions.
 - 2. Inspection After First Coat of Paint: Should defect become visible after first coat of paint has been applied, it shall be the General Contractor's responsibility to have all such conditions corrected by the drywall installer/finisher. Any corrected areas shall be re-primed at no additional cost to the Owner.
 - 3. Finish Coats: Application of subsequent coats of paint shall constitute acceptance of the drywall substrate by the painting applicator.
- C. Alkali Content Testing: Test concrete and masonry surfaces for alkalinity by performing appropriate tests, and neutralize as required for pH reading between 6.8 and 8.0, unless otherwise recommended by paint manufacturer. Test for pH following test method as described in ASTM D4262, utilizing litmus paper.
- D. Moisture Content Testing: Test concrete and masonry surfaces for moisture content by performing appropriate tests. Maximum moisture content must not exceed 17 percent as determined by a moisture meter, unless otherwise required by paint manufacturer.

3.2 SURFACE PREPARATION (GENERAL)

- A. General: Surface preparations and cleaning procedures shall be in strict accordance with the instructions and specifications of the paint manufacturer and with the requirements of this specification.
- B. Removal of Fixtures: Cooperate with other trades and coordinate removal of fixtures, hardware items, and equipment, as required for painting work. Items to be removed on surfaces to be painted include: switch and receptacle plates, escutcheons and like plates, surface-mounted equipment, free-standing equipment which blocks access to painting surfaces, grilles and louvers at duct openings into finished spaces, and other items as required and directed.
- C. Painting of Factory-Primed Door Hardware: Prior to painting, mask all operating parts so that item works freely after paint is dry. Remove any excess paint from operating parts and clean and free-up the operation of any parts which do not operate smoothly due to the painting operation.

3.3 SURFACE PREPARATION FOR SPECIFIED SUBSTRATES

- A. Uncoated Ferrous Metal: Thoroughly degrease surfaces using solvent (SSPC-SP 1) and remove rust and foreign matter by scraping, sanding, wire brushing, or other abrasion methods as necessary in accordance with SSPC-SP 2 and SSPC-SP 3. Remove pits and clean to bright metal before priming. Apply primer on the same day.
- B. Shop-Coated Ferrous Metal: Thoroughly degrease surfaces and clean using solvent (SSPC-SP 1). Remove loose rust, blistered and peeling paint to bare metal by scraping, sanding, wire brushing, or other abrasion methods in accordance with SSPC-SP 2 or SP 3; feather edges of adjacent sound paint. Dull glossy surfaces by scuff-sanding and wipe down. Spot-prime all abraded portions, rust areas, and bare surfaces with specified primer on same day.
- C. Galvanized Metal (Unpainted): Clean surfaces, wash and etch, to remove factory films and oily residue as recommended by the paint manufacturer. Responsibility for insuring that the surface is properly prepared rests with the painting sub-contractor. Clean galvanized metal the same day to be painted. If a pretreatment wash primer is recommended by manufacturer, apply pretreatment not more than 8 hours in advance of applying primer.
- D. Concrete: Clean surfaces free from dirt, grease, oil, efflorescence, and other foreign substances. Remove mortar droppings, glaze, and scale.
 - 1. Concrete stains resulting from weathering of corroded metals may be removed by washing the surface with a solution composed of 2 to 8 ounces of sodium metasilicate per gallon of hot water; rinse thoroughly with fresh water.
 - 2. Dirt, grease and oil may be removed by washing the surface with a solution composed of 2 to 8 ounces of trisodium phosphate (TSP) per gallon of hot water (150 – 200 degrees F); rinse thoroughly with fresh water.
 - 3. Efflorescence may be removed by scraping, wire brushing and washing with a 5 to 10 percent by weight solution of muriatic acid; rinse thoroughly with fresh water.
 - 4. Glazed mortar droppings, loose particles, and scale may be removed by wire brushing.
- E. Concrete Masonry: Remove all dust and loose mortar by brushing. Neutralize alkali or efflorescence with wash solution recommended by paint manufacturer. Thoroughly clean off resulting crystals with stiff brushes.

- F. Gypsum Wallboard: Remove all dust and dirt with a brush; if necessary, clean surfaces using damp rags or sponges. Repair of surface defects and Level of finishing is specified in Section 092116 – Gypsum Board Assemblies.
- G. Wood and MDF: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - 1. Field Painted Doors: Seal cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
 - 2. MDF: Prime and seal both face and concealed surfaces at coverage rate indicated.

3.4 CLEANING PRIOR TO PAINTING

- A. Remove dust and loose deleterious materials from all surfaces before beginning painting operations. Program the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.

3.5 APPLICATION OF PAINT

- A. Mixing: Mix paint materials in accordance with the manufacturer's instructions and directions. Mix often enough during application to keep the paint uniform and to ensure complete dispersion of pigment and a uniform composition.
 - 1. Prepare multiple component coatings using all of the contents of the container for each component as packaged by the manufacturer. Mixing of partial kits will not be permitted. Multiple component coatings that have been mixed shall not be used beyond their pot life. Only the components specified and furnished by the manufacturer, including thinner if required, shall be mixed.
- B. Application: Apply paint in accordance with the manufacturer's directions. Use techniques best suited for substrate and type of material being applied. Apply using airless spray to greatest extent possible for doors and door frames and other medium to high gloss paints. Brushes and rollers shall be of a type best suited for the type of material being applied.
 - 1. Apply intermediate and finish coats within the manufacturer's recommended top coating time periods.
 - 2. When applying paint to drywall, use a roller nap no greater than 3/8 inch so as to achieve a light stipple finish.
 - 3. If metal doors, and plaster surfaces are not sprayed, finish may be applied with 1/4 inch nap roller. Brush and level out paint applied to metal door frames to achieve a nearly sprayed-on appearance.
 - 4. When painting MDF panels, use same materials and method used on approved mock-up.
- C. Apply each coat of paint as a continuous film of uniform thickness, free from holidays, sags, crawls, pinholes, blisters, unevenness in color, or other evidence of poor workmanship. Repaint thin spots or areas missed in the application and allowed to dry before applying next coat of paint.
 - 1. Give special attention to ensure that surfaces, such as edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 - 2. Each coat shall be free of dirt, dust, moisture, etc., prior to application of next coat.

- D. Allow each coat of paint to thoroughly dry, full thickness of the film, before application of the succeeding coat. Paint is considered dry for recoating when the next coat can be applied without the development of any detrimental film irregularities such as wrinkling, lifting, or loss of adhesion of the previous coat.
- E. Coverage for each paint material is specified as either the total minimum dry film thickness in mils or the spreading rate in square feet per gallon over the surface designated. Actual coverage rate will vary depending upon the texture and porosity of the surface, climatic conditions, etc.
 - 1. The number of coats specified is the minimum required, irrespective of the coating thickness.
 - 2. In the event the required paint thickness is not achieved, or coating shows through, apply additional coats until the required thickness is obtained. For deep tone colors, provide mock-up to confirm coverage and mil thickness, base coat on two top coat application. Cost for additional coats to prevent show through shall be borne by the Installer.
 - 3. Do not exceed manufacturer's recommended maximum film build-up per coat (wet mils).
- F. Recoat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat to ensure a finish coat with no burn-through or other defects.
- G. Sand lightly between coats of enamel to produce an even, smooth finish. Wipe to remove dust before recoating.
- H. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
- I. Do not paint over any code-required labels or any equipment identification or nomenclature plates.
- J. Tops and bottoms of metal and wood doors shall be finished the same as the faces (primed and two finish coats of paint).
- K. Door Frames: Unless otherwise indicated, provide color to match adjacent wall color.
- M. Back-Priming/Sealing Wood: Apply first coat of primer/sealer to backs and ends of board, panels, cabinetry, and trim which will be concealed in the work, prior to installation. Refer to respective Related Sections or back priming for wall panels.

3.6 DAMAGED PAINT SURFACES

- A. General: Before final acceptance of the work by the Architect and Owner's Representative, repair or re-finish painted surfaces which have been damaged at no additional cost. Refinish whole wall where portion of finish is not acceptable.
- B. Areas of chipped, peeled, or abraded paint shall be hand or power sanded, feathering the edges. Prime and finish coat the areas using the same material as originally scheduled. Depending on the extent of repair and its appearance, an overall finish coat may be required by the Architect to achieve uniform appearance.

3.7 CLEAN-UP

- A. General: During the progress of the work, remove from the project all discarded paint materials, rubbish, cans and rags. Leave premises clean and in orderly condition.
- B. Cleaning: Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

PART 4 - SCHEDULES

4.1 PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates wherever these materials occur in the Contract Documents, except as noted otherwise. Unless otherwise specified, the following paint systems are made up of products identified by Benjamin Moore & Company trade names and numbers.
 - 1. It is not the intent to limit products to manufacturer indicated, but rather to establish a quality which is required for this Project; other manufacturers not listed under PART 2 PRODUCTS shall submit a substitution request in accordance with Section 016000 – Product Requirements. Substitutions for products or features not listed above must be formally approved by RWS/DEV team.
 - 2. Actual sheen in the finish coat(s) may be changed as a result of field mock-up or initial paint sample submittal. Should paint sheen change and the specified product is not available in the requested sheen, then painting contractor shall provide equal or better paint material in the requested sheen at no additional cost to the Owner. Sheens noted in this schedule are to be used in the locations described, except as noted on the drawings (finish legend)
 - 3. Verify compatibility of top coats with shop primers applied under Related Sections. Apply intermediate coat or ties coat as required to obtain manufacturer's recommended adhesion for the intended use and service for each environment.
 - 4. Reference to coverage rate, or DFM means the minimum dry film thickness required per coat.

4.2 INTERIOR SURFACES

- A. Paint sheen shall be as indicated in this section UNO in the Finish Legend
- B. Gypsum Wallboard (New): Latex, Semi-Gloss for walls scheduled to receive deep tone or accent colors.
 - 1. Benjamin Moore & Company
 - a. Primer: Super Spec Latex Enamel Undercoater and Primer Sealer 0253; coverage rate – 400 to 500 square feet per gallon. Primer shall be tinted to range of color of finish coats. Primer shall be tinted to range of color of finish coats; (VOC 55 g/l).
 - b. Two Finish Coats: Ultra Spec 500, Semi-gloss N539 coverage rate - 350 to 400 square feet per gallon per coat per gallon per coat; (VOC 0 g/l).
 - 2. PPG
 - a. Primer: Seal Grip Acrylic Universal Primer, 17-921XI.
 - b. Two Finish Coats: Speedhide Zero Interior Latex, 6-5000 Series.

3. Sherwin Williams
 - a. One Primer Coat: PrepRite ProBlock.
 - b. Two Finish Coats: Promar 200 0 VOC Semi-gloss.
- C. Gypsum Wallboard (New): Latex, Eggshell for typical walls, unless noted otherwise.
 1. Benjamin Moore & Company
 - a. Primer (Untreated Gypsum Board): Ultra Spec 500 Latex Primer N534 ; coverage rate 350 to 400 square feet per gallo; (VOC 0 g/l).
 - b. Two Finish Coats: Ultra Spec 500, Eggshell N538 coverage rate - 350 to 400 square feet per gallon per coat; (VOC 0 g/l).
 - 1) Note: For wall areas to be covered with wood veneer paneling or acoustical wall panels, prime coat surfaces only.
 2. PPG
 - a. Primer: Speedhide Zero Interior Latex Sealer, 6-4900XI.
 - b. Two Finish Coats: Speedhide Zero Interior Latex, 6-5000 Series.
 3. Sherwin Williams
 - a. One Primer Coat: ProMar 200 0 VOC Primer.
 - b. Two Finish Coats: Promar 200 0 VOC Eggshell.
- D. Gypsum Wallboard (New): Latex, Flat for typical ceilings, except at wet areas unless noted otherwise.
 1. Benjamin Moore & Company
 - a. Primer (Untreated Gypsum Board): Ultra Spec 500 Latex Primer N534 coverage rate - 350 to 400 square feet per gallon; (VOC 0 g/l).
 - b. Two Finish Coats: Ultra Spec 500, Flat N536 coverage rate - 350 to 400 square feet per gallon per coat; (VOC 0 g/l).
 2. PPG
 - a. Primer: Speedhide Zero Interior Latex Sealer, 6-4900XI.
 - b. Two Finish Coats: Speedhide Zero Interior Latex, 6-5000 Series.
 3. Sherwin Williams
 - a. One Primer Coat: ProMar 200 0 VOC Primer.
 - b. Two Finish Coats: Promar 200 0 VOC Flat.
- E. Gypsum Wallboard (New): Latex, Semi-Gloss for wet areas, toilets, janitor rooms, and service areas, unless noted otherwise.
 1. Benjamin Moore & Company
 - a. Primer (Untreated Gypsum Board): Ultra Spec 500 Latex Primer N534 coverage rate - 350 to 400 square feet per gallon; (VOC 0 g/l).
 - b. Two Finish Coats: Ultra Spec 500, Semi-gloss N539 coverage rate -350 to 400 sq-ft per gallon per coat; (VOC 0 g/l).
 2. PPG
 - a. Primer: Speedhide Zero Interior Latex Sealer, 6-4900XI.
 - b. Two Finish Coats: Speedhide Zero Interior Latex, 6-5000 Series.
 3. Sherwin Williams
 - a. One Primer Coat: ProMar 200 0 VOC Primer.
 - b. Two Finish Coats: ProMar 200 0 VOC Semi-Gloss.
- F. Gypsum Wallboard (New): Epoxy, Semi-Gloss for walls in toilet rooms and showers.
 1. Benjamin Moore & Company

- a. Primer (Untreated Gypsum Board): Ultra Spec 500 Latex Primer N534 coverage rate - 350 to 400 square feet per gallon; (VOC 0 g/l).
 - b. Two Finish Coats: Corotech Water Based Catalyzed Epoxy Semi-Gloss V341 coverage rate - 350 to 400 square feet per gallon per coat; (VOC 50 g/l).
 2. PPG
 - a. Primer: Aquapon WB EP Epoxy Primer.
 - b. Two Finish Coats: Aquapon WB EP Epoxy Finish.
 3. Sherwin Williams
 - a. One Primer Coat: ProMar 200 0 VOC Primer.
 - b. Two Finish Coats: Pro Industrial WB Catalyzed Epoxy.
- G. Gypsum Wallboard to Receive Wallcoverings: Latex, Satin-Like.
 1. Benjamin Moore & Company
 - a. Primer: Ultra Spec 500 Latex Primer N534 coverage rate – 350 to 400 square feet per gallon; (VOC 0 g/l).
 2. PPG
 - a. Primer: Speedhide Zero Interior Latex Sealer, 6-4900XI.
 3. Sherwin Williams
 - a. One Primer Coat: ProMar 200 0 VOC Primer.
- H. Concrete (New) and Concrete Masonry: Latex, Eggshell. (for walls not in restrooms or locker rooms)
 1. Benjamin Moore & Company
 - a. Primer: Ultra Spec Masonry Int/Ext 100% Acrylic Sealer 0608
 - b. Two Finish Coats: Ultra Spec 500, Eggshell N538; coverage rate - 350 to 400 square feet per gallon per coat; (VOC 0 g/l).
 2. PPG
 - a. Primer: Seal Grip Acrylic Universal Primer, 17-921XI.
 - b. Two Finish Coats: Speedhide Zero Interior Latex, 6-5000 Series.
 3. Sherwin Williams
 - a. One Primer Coat: Loxon Primer Sealer.
 - b. Two Finish Coats: ProMar 200 0 VOC Eggshell.
- I. Concrete Masonry and Concrete (New): Epoxy, Semi-gloss. (walls in restrooms and locker rooms)
 1. Benjamin Moore & Company
 - a. Primer: Ultra Spec Masonry Int/Ext High Build Block Filler 0571, coverage rate 75 - 100 square feet per gallon: (VOC 45 g/l) film thickness at 10 mils.
 - b. Two Finish Coats: Corotech Water Based Catalyzed Epoxy Semi-Gloss V341 coverage rate 350 - 400 square feet per gallon: (VOC 50 g/l) film thickness at N mils.
 2. PPG
 - a. Primer: Aquapon WB EP Epoxy Primer.
 - b. Two Finish Coats: Aquapon WB EP Epoxy Finish.
 3. Sherwin Williams
 - a. One Primer Coat: Pro Industrial HD Block Filler.
 - b. Two Finish Coats: Pro Industrial WB Catalyzed Epoxy.

- J. Wood: Latex, Semi-Gloss for pass doors, and trim.
1. Benjamin Moore & Company
 - a. Primer: Super Spec Latex Enamel Undercoater and Primer Sealer 0253
 - b. Two Finish Coats: Ultra Spec 500, Semi-gloss N539 coverage rate - 350 to 400 square feet per gallon per coat; (VOC 0 g/l).
 2. PPG
 - a. Primer: Seal Grip Acrylic Universal Primer, 17-921XI.
 - b. Two Finish Coats: Advantage 900 Interior/Exterior Styrene Acrylic, 900-00 Series.
 3. Sherwin Williams
 - a. One Primer Coat: QD Primer.
 - b. Two Finish Coats: Pro Industrial Acrylic Semi-Gloss.
- K. Ferrous Metal (New): Latex Semi-Gloss for all metal items, including stairs, railings, metal doors, frames and remaining metal items. At Stair 04: all associated steel stair framing, guardrails, and infill panels to be Satin.
1. PPG
 - a. Primer: Pitt Tech Plus Primer/ Finish 4020/ 90-1912.
 - b. Two Finish Coats: Pitt Tech Plus EP Int./Ext. Industrial Enamel.
 2. Sherwin Williams
 - a. One coat: SW Universal Alkyd Primer
 - b. Two coats: SW Pro Industrial Waterbased Alkyd Urethane
- L. Elevator Hoistway Doors and Frames: Polyurethane, Satin.
1. Benjamin Moore & Company
 - a. Primer (Touchup): Corotech Polyamide Epoxy Primer V150; DFM–2.5 to 2.8 minimum (VOC 100 g/l)
 - b. One Finish Coat: Corotech Aliphatic Acrylic Urethane Semi-Gloss V510, DFM – 2.0-2.8 total minimum. (VOC 50 g/l)
 2. PPG
 - a. Primer: Amerlock 2/400 Epoxy.
 - b. Finish Coats: Pitthane Ultra LS, Aliphatic Acrylic Polyurethane.
 3. Sherwin Williams
 - a. One Primer Coat: Macropoxy 646.
 - b. Finish Coats: Hi Solids Polyurethane.
- M. Elevator Hoistway Doors and Frames: Polysiloxane, Satin (upgraded system usable at the contractor's option).
1. PPG
 - a. Primer: Amerlock 2/400 Epoxy.
 - b. Finish Coats: PSX 805, low VOC.
- N. Wood – Clear Finish: Polyurethane Varnish, Waterborne, Gloss or Satin as approved by Architect.
1. Benjamin Moore & Company
 - a. Primer: Benwood N422 coverage rate -400-500 square feet per gallon; (VOC 275 312 g/l).
 - b. Top Coat: Benwood N422 coverage rate -400-500 square feet per gallon; (VOC 275 g/l).

2. PPG
 - a. Primer/ Finish: PPG Paints Deft Interior Polyurethane Water-Based Acrylic, DFT159 Satin, DFT157 Gloss.
 3. Sherwin Williams
 - a. Primer: Minwax Waterborne Polyurethane.
- O. Mechanical and Electrical Equipment Items: (Interior of all Ducts at Grilles, Registers and Diffusers)
1. Benjamin Moore & Company
 - a. Primer: Ultra Spec HP Acrylic Metal Primer HP04 DFM 2.0 (VOC 45 g/l).
 - b. One Finish Coat: Ultra Spec 500, Flat N536 coverage rate - 350 to 400 square feet per gallon per coat (VOC 0 g/l); Color Black.
 2. PPG
 - a. Primer: Pitt Tech Plus Primer/ Finish 4020/ 90-1912.
 - b. Two Finish Coats: Pitt Tech Plus EP Int./Ext. Industrial Enamel.
 3. Sherwin Williams
 - a. One Primer Coat: DTM Primer Finish.
 - b. One Finish Coat: ProMar 200 Flat.
- P. Graphic floor paint
1. PPG: Break-Through Interior/Exterior Water-Borne Acrylic, V52-410 Series, Satin.
 2. SW Armorseal 8100
 3. Clear sealer as recommended by paint manufacturer.
- Q. Open to Structure Areas and all MEP elements in ceiling zone:
1. Dryfall paint
 - a. BOD: Sherwin Williams Pro Industrial Waterborne Acrylic Dryfall
 - b. PPG: Speedhide Super Tech Water Based Interior Dry-Fall.
- 4.3 PAINT COLOR SCHEDULE
- A. Refer to drawings for technom designations and assigned colors.

END OF SECTION 099000

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. **(CG-02)** Custom fabricated and pre-manufactured corner guards where indicated on drawings.
- B. Related Sections
 - 1. 018119 – Indoor Air Quality (IAQ) Requirements: (IAQ) goals and performance testing.
 - 2. 092900 – Gypsum Board

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's literature and installation instructions.

1.3 DELIVERY, HANDLING & STORAGE

- A. Deliver corner guards in unopened protective packaging. Maintain protective covers on all items until installation is complete. Remove covers at final clean-up of installation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Refer to drawings for technom designations and product descriptions.
- B. Adhesive or Tape: Low-odor, low-VOC, or double-faced adhesive foam tape adhesive for applying stainless steel corner guards shall be of type as recommended by corner guard manufacturer.
 - 1. VOC content: per IEQ Credit 2 - Low-Emitting Materials(LEED v4.1) criteria,.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation and other conditions affecting performance of work.
- B. For impact-resistant wall-protection units attached with adhesive or foam tape, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing impact-resistant wall-protection system components.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. General: Install impact-resistant wall-protection units level, plumb, and true to line without distortions. Do not use materials which are bent or distorted in any way and which will be visible in the finished Work.
- B. Corner Guards: Install corner guards at locations indicated on the drawings in accordance with the manufacturer's directions. Apply adhesive to back of corner guards and place in position, pressing firmly to wall; remove excess adhesive from around edges and allow to dry a minimum of 24 hours.

3.4 CLEANING

- A. Immediately after completion of installation, clean surfaces and accessories using a standard, ammonia-based, household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102613

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire-protection cabinets:
- B. Related Requirements:
 - 1. Section 099000 "Painting and Coating" for field applied paint finish for exposed portions of cabinets.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semirecessed-, or surface-mounting method and relationships of box and trim to surrounding construction.
- B. Shop Drawings: For fire-protection cabinets.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
- C. Product Schedule: For fire-protection cabinets and extinguishers. Indicate whether recessed, semirecessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.3 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

- A. Fire-Rated Fire-Protection Cabinets Rating: Provide recessed fire extinguisher cabinets with same hourly rating as wall; listed and labeled to comply with requirements of ASTM E 814 for fire-resistance rating of walls where they are installed. Provide portable fire extinguishers which are UL listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.
- B. Service Tags: Provide each fire extinguisher with an identification tag indicating the month and year installed, year hydraulic tested, location of extinguisher, City Certification number, and space for inspector's initials.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.
 - 1. Include signed document stating that AHJ has inspected and given its final approval for fire extinguisher work under this section where required.
- B. As a condition for final acceptance, the contractor shall submit the following documents to the Owner:
 - 1. Complete extinguisher inventory including all changes.

1.6 COORDINATION

- A. Coordinate rough opening sizes and locations of fire-protection cabinets with wall depths.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver fire extinguisher cabinets to building in unopened protective packaging, labeled with manufacturer's name and model numbers as they appear on products. Store cabinets in their original packaging in a dry location.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

2.2 FIRE-PROTECTION CABINET (**FEC**)

- A. Manufacturers: Subject to compliance with requirements provide products of one of the following:
 - 1. J. L. Industries
 - 2. Larsen's Manufacturing Company.
- B. Basis-of-design product: JL Industries "Ambassador" Duo
- C. Cabinet Construction: Nonrated and rated to match existing wall type as indicated in drawings.
 - 1. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch-thick cold-rolled steel sheet lined with minimum 5/8-inch-thick fire-barrier material. Provide factory-drilled mounting holes.
- D. Cabinets Size: As required to fit existing extinguisher.
- E. Cabinet Material: Cold-rolled steel sheet
- F. Semirecessed Cabinet : One-piece combination trim and perimeter door frame overlapping surrounding wall surface, with exposed trim face and wall return at outer edge (backbend).
 - 1. Fire-Protection Cabinet Type: Suitable for fire extinguisher or as hose cabinet at existing location.
 - 2. Square-Edge Trim: 1-1/4- to 1-1/2-inch backbend depth.
 - 3. Cabinet Material: Cold-rolled steel sheet.
 - 4. Door Material: Steel sheet
- G. Cabinet Trim Material: Same material and finish as door.
- H. Door Style: partially glazed.
- I. Door Glazing: vertical orientation, clear.
- J. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide manufacturer's standard.
 - 2. Provide continuous hinge, of same material and finish as trim,, permitting door to open 180 degrees.

K. Accessories:

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. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet glazing.
 - 2) Lettering Color: Red.
 - 3) Orientation: Vertical.
3. Fire Extinguisher Identification Signs (Where Cabinet/Bracket/Extinguisher is Obscured From View – large rooms, parking garages, etc., or as required by the local Fire Marshall). Provided as part of signage per Section 101423 "Panel Signage."
 - a. Provide signs at each fire extinguisher to identify location. Mount signs on wall with message reading in both directions, at ceiling level, directly above extinguisher or extinguisher cabinet. Provide double faced, 12 inches high by 4 inches wide, with fire extinguisher symbol, arrow, and red with white letters reading "FIRE EXTINGUISHER", or other acceptable identify means approved by Architect.
 - b. Mounting height: 80-inches above finish floor

L. Materials:

1. Cold-Rolled Steel: ASTM A1008/A1008M, Commercial Steel (CS), Type B.
 - a. Finish: Factory primed for field painting.
 - b. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - c. Color: Custom to match adjacent wall color.
2. Tempered Float Glass: ASTM C1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.3 FABRICATION

- A. 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.
 1. Weld joints and grind smooth.
 2. Miter corners and grind smooth.
 3. Provide factory-drilled mounting holes.
 4. Prepare doors and frames to receive locks.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.
 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
 2. Fabricate door frames of one-piece construction with edges flanged.
 3. Miter and weld perimeter door frames and grind smooth.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

- B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire-protection cabinets after assembly.
- D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for hose valves and cabinets to verify actual locations of piping connections before cabinet installation.
- B. Examine walls and partitions for suitable framing depth and blocking where cabinets will be installed.
- C. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION OF FIRE-PROTECTION CABINETS

- A. General: Install fire-protection cabinets in existing locations.
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semirecessed fire-protection cabinets.
 - 2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
 - 3. Fire-Rated Cabinets:
 - a. Install cabinet with not more than 1/16-inch tolerance between pipe OD and knockout OD. Center pipe within knockout.
 - b. Seal through penetrations with firestopping sealant as specified in Section 078413 "Penetration Firestopping."
- C. General: Install mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
- D. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.
- E. Furnish fire extinguisher no sooner than 60 days, and no later than 14 days prior to scheduled substantial project completion.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. 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.
- E. 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 104413

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cleaning and re-installation of existing acoustic drapery.

1.2 ACTION SUBMITTALS

1. Cleaning service and proposed process.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data:** For products reinstalled to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Cleaning Service Qualifications:** Engage a commercial cleaning service with a minimum 5-year track record.

1.5 FIELD CONDITIONS

- A. Scheduling:** Do not re-install drapes until after other finish work, including painting, is complete and spaces are otherwise ready for occupancy.

PART 2 - PRODUCTS – Not Used

PART 3 - EXECUTION

3.1 DRAPE RE-INSTALLATION AND ADJUSTING

- A.** After hanging drapes, test and adjust each drapery track to produce unencumbered, smooth operation.
- B.** Steam and dress down drapes as required to produce crease- and wrinkle-free installation.
- C.** Re-clean and reinstall drapes that are stained or soiled.

END OF SECTION 122200

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. **(WOM-##)**: Walk off mats consisting of tile carpeting.

A. Related Sections

1. 018119 – Indoor Air Quality (IAQ) Requirements: (IAQ) goals and performance testing.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM B 221-93 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

B. American Architectural Manufacturers Association (AAMA)

1. AAMA 606.1 Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum
2. AAMA 607.1 Voluntary Guide Specifications and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for foot grilles and frames.

B. Shop Drawings: Show the following:

1. Divisions between floor mat sections.
2. Perimeter floor moldings.

C. Samples: For the following products, in manufacturer's standard sizes:

1. Two (2) carpet samples for each type, pattern and colorway.

1.4 QUALITY ASSURANCE

A. Accessibility Requirements: Provide installed foot grilles that comply with Sections 302 and 303 in ICC A117.1.

1.5 PROJECT CONDITIONS

A. Field Measurements: Indicate measurements on Shop Drawings.

1.6 WARRANTY

A. Floor mats and frames shall be fabricated free of defects in materials and workmanship and the manufacturer shall offer a 2 year warranty against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide foot grilles and frames capable of withstanding the following loads and stresses:
 - 1. Uniform floor load of 300 lbf/sq. ft.
 - 2. Standard rolling load performance to be 500 lb/wheel (load applied to a solid 5" x 2" wide polyurethane wheel, 1000 passes without damage).
 - a. Note: Standard products do not meet this requirement. Custom engineering and fabrication required.

2.2 WALK OFF GRATING MAT

- A. Manufacturers: Subject to compliance with requirements for walk off mats, provide by one of the following:
 - 1. Milliken (Basis of Design)

2.3 WALK OFF MATS

- A. Walk off mat (**WOM-##**): Refer to drawings for technom designation and product information.

2.4 FABRICATION

- A. Shop fabricate floor mat to greatest extent possible in sizes as indicated. Unless otherwise indicated, provide each floor mat as a single unit; do not exceed manufacturer's recommended maximum sizes for units that are removed for maintenance and cleaning. Where joints in floor mat are necessary, space symmetrically and away from normal traffic lanes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and floor conditions for compliance with requirements for location, size, minimum recess depth, and other conditions affecting installation of floor mat and frames.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install floor mat and frames to comply with manufacturer's written instructions at locations indicated and with floor mat and frames in relationship to one another and to adjoining finished flooring as recommended by manufacturer. Coordinate top of floor mat surfaces with doors that swing across mat and frame to provide clearance under door.

3.3 PROTECTION

- A. After completing frame installations, provide temporary filler of plywood or fiberboard in recesses and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and Project is near Substantial Completion.

END OF SECTION 128413

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittals
- B. Coordination
- C. Delivery, Storage and Handling
- D. Summary Description
- E. Common Product Requirements
- F. Common Execution Requirements

1.2 GENERAL REFERENCES

- A. Contract Documents: Refer to complete set of Contract Documents for requirements that are related to or may affect the work described in this Section.

1.3 SUBMITTALS

- A. Action Submittals
 - 1. Submittals and Shop Drawings: Submit in accordance with Division 01 requirements.
 - 2. Submit in electronic PDF format. Submittals shall show:
 - a. Indicate listing by UL/ULC/CSA or other approved testing agency.
 - b. Highlight adequate information to demonstrate materials being submitted fully comply with contract documents.
 - c. Review and check all material prior to submittal and stamp.
 - 3. Shop drawings shall show:
 - a. Ratings of items and systems.
 - b. How the components of an item or system are assembled, interconnected, function together and how they will be installed on the project.
 - c. System layout floor plans with complete device layout, point-to-point wiring connection between all components of the system, wire sizes and color coding.
 - d. Riser diagrams showing vertical wiring between components.
 - e. Line diagrams and or logical/control schematics including interface to other systems as applicable. Provide point to point wiring diagrams, indicate terminal identification at item of equipment. Typical diagrams may be used when accompanied by wire schedules that are specific to each product.
 - f. Coordinate with other division shop drawings and submittals. Identify interface points and indicate method of connection.
 - g. List of all Division 26 equipment noting actual rating of equipment that will be installed. For discrepancies between the requirements of the proposed equipment and the equipment provisions indicated on the drawings, indicate the contractor's proposed no cost change to the electrical system to accommodate the submitted equipment.

4. Release of Drawing Data files

- a. Contractor may request to utilize the project drawing data files for assistance in producing shop drawings. Request shall be made by signing Owner's Representative requested documentation for release of the data files. The data files are not intended to be used for construction. The contractor is responsible for all construction requirements, coordination, and installation.
- b. Conditions of electronic document transfer:
 - 1) The requested electronic file(s) (the "Files") remain the property of Owner's Representative
 - 2) No warranties or guarantees are made that the Files represent or reflect the complete scope of work and/or as-built condition.
 - 3) Owner's Representative assumes no responsibility for data files supplied in electronic format. Such data is being provided as a courtesy only.
 - 4) Company receiving the Files and users thereof accept full responsibility for verifying the accuracy and completeness of the Files and shall indemnify and hold Owner's Representative, its officers, employees, consultants and agents harmless from any claims or damages arising from the use of the Files.
 - 5) The use of Files to alter or revise the scope of work is not permitted unless authorized by change orders.
 - 6) In the event that drawing Files transferred electronically contain electronic copies of permits or professional seals, the Files shall be immediately returned to Owner's Representative and all copies thereof destroyed.
 - 7) No use shall be made of the Files for any purpose other than that for which they were originally intended without the express written consent of Owner's Representative.
 - 8) No retransmission of the Files in any form to any third party is permitted unless authorized in writing by Owner's Representative.

B. Operation and Maintenance Materials

1. Provide O&M manuals required in Division 01 for all equipment furnished under Division 26 - Electrical of the specifications. Submit for review in electronic PDF format. Incorporate any review comments and return final copies as noted in Division 01.
2. The information included must be the exact equipment installed. Where sheets show the equipment installed and other equipment, the installed equipment shall be neatly and clearly identified on such sheets.
3. These O&M manuals shall contain all the information needed to configure, operate and maintain all systems and equipment provided in the project. Present and arrange information in a logical manner for efficient use by the Owner's operating personnel. The information provided shall include but not be limited to the following:
 - a. Equipment manufacturer, make, model number, size, nameplate data, etc.
 - b. Description of system configuration and operation including component identification and interrelations. A master control schematic drawing(s) may be required for this purpose.
 - c. Dimensional and performance data for specific unit provided as appropriate.
 - d. Manufacturer's recommended operation instructions.
 - e. Manufacturer's recommended servicing data including frequency.
 - f. Complete parts list including reordering information, recommended spares and anticipated useful life (if appropriate). Parts lists shall give full ordering information

assigned by the original parts manufacturer. Relabeled and/or renumbered parts information as reassigned by equipment supplier not acceptable. Include the parts list and part diagram that was included with the product's packaging.

- g. Finalized shop drawings based on the actual equipment delivered and installed on site.
- h. Wiring diagrams.
- i. Equipment submittals shall contain step-by-step circuit description information designed to acquaint maintenance personnel with equipment operation in each mode of operation.
- j. A complete list of local (nearest) manufacturer representative and distributor contacts for each type of equipment and manufacturer. Include name, company, address, phone, e-mail address, and web site.

1.4 COORDINATION

- A. Coordination during the bidding and pricing aspects of the contract includes determining where the work of other Divisions relies on the work of this Division for electricity and including the electrical system to match the requirements.
- B. Coordinate work with that of the other Contractors and/or other trades doing work on the project. Examine all drawings and specifications of other trades for construction details and coordination. Make every reasonable effort to provide timely notice of work affecting other trades to prevent conflicts or interference as to space requirements, dimensions, openings, block-outs, sleeving or other matters which will cause delays or necessitate work-around methods.
- C. Obtain submittals and shop drawings of all equipment with electrical connections furnished under other divisions of the specification and by the Owner's Representative. Provide all wiring in accordance with specific equipment requirements. Immediately advise the Owner's Representative of any changes which may affect the contract price.
- D. Special attention is called to the following items. Coordinate all conflicts prior to installation:
 - 1. Door swings such that switches will be located on the "strike" side of the door.
 - 2. Location of grilles, pipes, sprinkler heads, ducts and other mechanical equipment so that all electrical outlets, lighting fixtures and other electrical outlets and equipment are clear from and in proper relation to these items.
 - 3. Location of cabinets, counters and doors so that electrical outlets, lighting fixtures and equipment are clear from and in proper relation to these items.
 - 4. Review specifications for other Divisions of the work to determine where other Divisions are requiring electrical connections. Verify electrical provisions shown on contract drawings by examining shop drawing submittals of other Divisions prior to submission to the owner. Do not proceed with ordering of supporting electrical equipment, such as circuit breakers, until electrical characteristics are verified. Proceed with rough-in only after verification of shop drawings.
- E. Furnish, install and place in satisfactory condition all raceways, boxes, conductors and connections and all other materials required for the electrical systems shown or noted in the contract documents to be complete, fully operational and fully tested upon completion of the project. Raceways, boxes and ground connections are shown diagrammatically only and indicate the general character and approximate location. The layout does not necessarily show the total number of raceways or boxes for the circuits required, nor are the locations of indicated runs intended to show the actual routing of the raceways.

- F. Provide inserts or sleeves for outlet boxes, conductors, cables and/or raceways as required. Coordinate the installation thereof with other trades.
- G. The Contractor will not be paid for relocation of work, cuttings, patching and finishing required for work requiring reinstallation due to lack of coordination prior to installation.

1.5 SUMMARY DESCRIPTION

- A. This section includes general electrical requirements for all Division 26 work and is supplemental and in addition to the requirements of Division 01. See Division 01 for sequence of work.
- B. It is the intention of this Division of the Specifications and the Contract Drawings to describe and provide for the furnishing, installing, testing and placing in satisfactory and fully operational condition all equipment, materials, devices and necessary appurtenances to provide a complete electrical system. Provide all materials, appliances and apparatus not specifically mentioned herein or shown on the drawings, but which are necessary to make a complete, fully operational installation of all electrical systems shown on the contract drawings or described herein. Connect equipment and devices furnished and installed under other Divisions of this specification (or the Owner's Representative) under this Division.
- C. Workmanship shall be of the best quality and competent and experienced electricians shall be employed and shall be under the supervision of a competent and experienced foreman.
- D. The drawings and specifications are complimentary and what is called for (or shown) in either is required to be provided as if called for in both. Where conflicting information occurs within the drawings and specifications or between the drawings and specifications, the more expensive alternative shall be used as a basis for bidding and construction.
- E. Branch Circuit Wiring: Where the drawings identify circuit numbers for items requiring electrical power, but do not indicate the manner of the wiring between the item and its source, the manner of the wiring shall be devised by the contractor utilizing the following provisions:
 - 1. Wire sizes:
 - a. Derate wiring for thermal restrictions imposed by the NFPA 70.
 - b. If wire sizes are not otherwise indicated, wire sizes shall limit the voltage drop for circuits serving general purpose receptacles to less than 3%, based on the receptacle in the circuit that is farthest from the source being utilized.
 - c. Wire sizes for other loads shall limit the voltage drop to less than 3% based on the load indicated on the panel schedule.
 - 2. Multiwire circuits: Multiwire circuits shall not be used unless specifically indicated or noted on the drawings. Provide a dedicated neutral conductor for each single pole circuit breaker.
 - 3. Do not combine wiring of different source panels in the same raceway system, unless the panels are interconnected with sub feed or through feed lugs with no intervening disconnecting means.
 - 4. Outlet and junction boxes: Arrange wiring extensions from junction boxes to outlet boxes to restrict the number of wires in an outlet box as required by NFPA 70.

1.6 WORK IN OTHER DIVISIONS

- A. See all other specifications for other work which includes but is not limited to:

1. Cutting and Patching
2. Painting, Refinishing and Finishes

1.7 APPLICABLE CODES AND STANDARDS

- A. The following codes and standards are referenced in the Division 26 specifications. Perform all work and provide materials and equipment in accordance with the applicable versions of the following referenced codes and standards as adopted by the Authorities Having Jurisdiction for the project:

1. American National Standards Institute (ANSI)
2. National Electrical Manufacturer's Association (NEMA)
3. National Fire Protection Association (NFPA)
 - a. NFPA 70 - National Electrical Code
 - b. NFPA 70B - Standard for Electrical Equipment Maintenance
 - c. NFPA 70E - Standard for Electrical Safety in the Workplace
 - d. NFPA 72 - National Fire Alarm and Signaling Code
4. Underwriter's Laboratories (UL)
5. National Electrical Contractor's Association (NECA)
6. International Code Council (ICC)
 - a. International Building Code (IBC)
 - b. International Fire Code (IFC)
 - c. International Energy Conservation Code (IECC)
7. Applicable State/Provincial and Local Codes and Ordinances
8. Americans with Disabilities Act (ADA)
9. The above listing of major codes and standards shall be considered part of the scope of this project. This list should not be considered comprehensive, and other applicable codes or standards not included in this list should not be excluded from the scope of the project.
10. The referenced codes establish a minimum level of requirements. Where provision of the various codes conflict with each other, the more stringent provision shall govern. If any conflict occurs between referenced codes and this specification, the codes are to govern. Compliance with code requirements shall not be construed as relieving the Contractor from complying with any requirements of the drawings or specifications which may be in excess of requirements of the governing codes and rules and not contrary to same.

1.8 PERMITS AND FEES

- A. Obtain and pay for all licenses, permits and inspections required by laws, ordinances and rules governing work specified herein. Arrange for inspection of work by the inspectors and give the inspectors all necessary assistance in their work of inspection.

PART 2 PRODUCTS

2.1 GENERAL

- A. All materials and equipment installed shall have been tested and listed by approved testing organization and shall be so labeled unless otherwise permitted by the Authority Having Jurisdiction.
- B. All materials to be new, free from defects and not less than quality herein specified. Materials shall be designated to insure satisfactory operation and operational life in the environmental conditions which will prevail where they are being installed.
- C. Each type of materials furnished shall be of the same make, be standard products of manufacturers regularly engaged in production of such materials and be the manufacturer's latest standard design.
- D. All materials, equipment and systems furnished that include provisions for storing, displaying, reporting, interfacing, inputting, or functioning using date specific information shall perform properly in all respects regardless of the century. Any interface to other new or existing materials, equipment or systems shall function properly and shall be century compliant, both in regards to information sent and received.

2.2 SUBSTITUTION OF MATERIALS

- A. Substitution of materials may be submitted prior to bid opening but must be approved by the Owner's Representative prior to acceptance. All bidding parties shall be notified of request and, if approved, acceptance.
- B. In all cases, should a substituted material result in requiring electrical system or building modifications; the Contractor alone shall pay all costs to provide these modifications including all costs to the Owner's Representative for redesign, and updating of record drawings required to accommodate the required modifications

PART 3 EXECUTION

3.1 PAINTING

- A. Items furnished under this Division that are scratched or marred in shipment or installation shall be refinished with touchup paint selected to match installed equipment finish.

3.2 DEMONSTRATION AND TRAINING

- A. Demonstrate that all electrical equipment operates as specified and in accordance with manufacturer's instructions. Perform tests in the presence of the Owner's Representative. Provide all instruments, manufacturer's operating instructions and personnel required to conduct the tests. Repair or replace any electrical equipment that fails to operate as specified and or in accordance with manufacturer's requirements.
- B. Contractor shall remove and replace covers of electrical equipment, open maintenance holes and remove/replace ceiling tiles to permit Owner's representative to observe equipment and wiring provided. For maintenance holes: Furnish equipment and personnel, including ventilation, safety harness, ladder and flashlight in compliance with local workplace health and safety regulatory bodies.

3.3 GENERAL

- A. All work shall be done in accordance with NECA construction standards.

- B. Adhere to industry standards of care for safety, including:
 - 1. Occupational Safety and Health Act.
 - 2. Accident Prevention Manual for Industrial Operations, National Safety Council.
 - 3. ANSI/NFPA 70E, Electrical Safety Requirements for Employee Workplaces.
 - 4. CSA Z462 - Workplace Electrical Safety
 - 5. American National Standards for Personnel Protection: Lockout/Tagout.
 - 6. Applicable state/provincial and local safety operating procedures.

3.4 CUTTING BUILDING CONSTRUCTION

- A. Submit details of any proposed structural modifications to Owner's Representative for approval and coordinate with other trades prior to cutting. Locate cuttings so they will not weaken structural components. Cut carefully and only the minimum amount necessary. Cut concrete with diamond core drills or concrete saws except where space limitations prevent the use of such tools.
- B. All construction materials damaged or cut into during the installation of this work must be repaired or replaced with materials of like kind and quality as original materials by skilled labor experienced in that particular building trade.

3.5 PENETRATION OF BUILDING ELEMENTS

- A. General:
 - 1. Penetrations of building elements by electrical systems shall not compromise the performance and integrity of the building element (structural, fire, smoke, waterproof, etc.)
- B. Fire and smoke rated elements:
 - 1. Electrical penetrations of fire and smoke rated floor and wall assemblies shall maintain fire-resistance or smoke barrier rating of the assembly. Firestopping materials and installation requirements are specified in Division 07.

3.6 CLEAN UP

- A. Contractor shall continually remove debris, cuttings, crates, cartons, etc., created by his work. Such clean up shall be done daily and at sufficient frequency to eliminate hazard to the public, other personnel, the building or the Owner's Representatives. Before acceptance of the installation, Contractor shall carefully clean cabinets, panels, lighting fixtures, wiring devices, cover plates, etc., to remove dirt, cuttings, paint, plaster, mortar, concrete, etc. Blemishes to finished surfaces of apparatus shall be removed and new finish equal to the original applied.
 - 1. Wipe surfaces of electrical equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - 2. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace defective fixtures or fixture components.

END OF SECTION 260500

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Existing Materials.
- B. Existing Materials to be Installed.
- C. Existing Materials not to be Reinstalled.

1.2 GENERAL REFERENCES

- A. Contract Documents: Refer to complete set of Contract Documents for requirements that are related to or may affect the work described in this Section.

1.3 SUBMITTALS

- A. Action Submittals

1.4 INDICATED EXISTING SYSTEMS

- A. The electrical drawings show portions of the existing electrical systems which are to remain, be removed, or be modified. The existing information is derived from record drawings and other data obtained from or with the permission of the Owner's Representative . Where indicated, concealed systems are also derived from record drawings and the Owner's Representative s best judgment of the configuration.
- B. The Contractor shall inspect the existing installation prior to bidding and shall judge the work required. Inspection shall include areas within and adjacent to the work of any discipline or trade performing work for the contract.
- C. The complete extent of the existing systems could not be verified during creation of the construction documents. The contractor shall inspect the existing systems on site and determine the exact amount of demolition required.

1.5 POWER OUTAGES

- A. The facility will continue its normal operation during construction; the Contractor shall schedule electrical system(s) outages with the Owner's Representative Electrical system(s) outages to Owner occupied areas shall not be permitted during normal operating hours. Confirm operating hours with Owner's Representative .
- B. Contractor shall work closely with Owner's Representative to assure the Owner fully understands the extent of each outage. Owner's Representative maintains the right to limit the extent and length of any given outage. Assume all outages to Electrical system(s) in Owner occupied areas will require premium time and that temporary electrical work may be required to limit the duration of outages.
- C. Cutovers must make alternative arrangements to deliver power to the load at all times. Cutovers time must be minimized.
- D. Submit a written request for a power outage in accordance with the Owner's Representative notice requirements in advance identifying the areas and systems that will be

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affected, time and duration of the power outage. The Contractor shall receive written authorization to proceed with the outage and shall re-notify the Owner's Representative at least 24-hours prior to the outage and also notify the Owner's Representative when the outage is completed.

- E. **Unscheduled Outages:** In the event that the Contractor's work directly causes or contributes to an unscheduled outage or fault in the electrical or other facility systems, the Contractor shall promptly correct the issue at no additional cost to the Owner. This includes any premium time required to remain on-site and expedited shipping for parts not locally available. The Contractor shall also repair any damage resulting from their work to ensure continued facility operation and integrity.

PART 2 PRODUCTS

2.1 EXISTING MATERIALS

- A. All materials which are a part of the building shall remain the property of the Owner.

2.2 EXISTING MATERIALS TO BE REINSTALLED

- A. Existing materials and equipment (except interior, undamaged raceways) that are removed as a part of the work or stored in surplus shall not be reinstalled as a part of the new systems unless specifically noted or authorized in writing by the Owner's Representative. The requirements of the specifications (i.e., condition, installation, testing, etc.) shall apply as if the materials were new, furnished by the Contractor.

2.3 EXISTING MATERIALS NOT TO BE REINSTALLED

- A. In coordination with the Owner's Representative, these materials shall be made available for inspection and decision as to whether the Owner will retain possession. Items selected for retention shall be turned over to the Owner's Representative. These items shall be delivered to a location on the premises selected by the Owner's Representative. Take reasonable care to avoid damage to this material. If the Contractor fails to conform to this requirement, he shall purchase and turn over to the Owner's Representative replacement material of like kind and quantity.
- B. All material not selected for retention by the Owner's Representative and debris shall be legally disposed of by the Contractor.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

- A. Examine the structure, building, and conditions under which electrical work is to be installed for conditions detrimental to proper and timely completion of electrical work. Do not proceed with work until deficiencies or detrimental conditions have been corrected. Report deficiencies or detrimental conditions of existing electrical work which might be unsuitable to connect with or receive other work. Failure to so report shall constitute acceptance of other work as being fit and proper for the reception of electrical work.
- B. Field trace all existing circuitry affected by the project to determine:
 - 1. Source of supply or information collection point within the project area
 - 2. Load or termination within the project area

3. Load or termination outside the project area, but supplied from or connected to equipment within the project area
4. Loads supplied from and located outside of the project area, but have circuitry within the project area.

3.2 REMOVAL

- A. All removal work required under this contract is not shown on the electrical drawings. Refer to work of other divisions for contract work that may affect existing electrical systems. Coordinate work between trades prior to bid.
- B. Unused raceways and wire shall be removed back to source if accessible, otherwise cut flush at ceiling, floor, or wall and fill with appropriate material to match the existing conditions, including any fire rating.
- C. If Contractor questions whether a particular device is to be removed notify the Owner's Representative noting type and location of device. If so directed the Contractor shall maintain the existing device in service without any change in contract price.
- D. Contractor shall divert all electrical demolition materials including, but not limited to, copper and aluminum cabling, fixture ballasts and lamps, enclosures, raceways and bus ducts, to either a local recycling station or to the on-site recycling station as provided by the General Contractor or Owner's Representative .

3.3 EXISTING SYSTEMS MAINTAINED

- A. Maintain existing systems not identified for demolition. Maintaining existing systems includes relocating the systems to coordinate with work of this contract, when work of this contract cannot be done while the existing system is in its present location.
- B. Any existing wiring serving devices to remain in service and which may be affected by work performed under this contract shall be rerouted to maintain circuit continuity. Contractor shall assume the risk of maintaining existing systems, except relocation of wiring of #2 AWG and larger shall be considered an additional cost if not shown to be relocated. If such wiring is found the Contractor shall notify Owner's Representative of wiring location, reason it must be removed and cost of relocation and receive the Owner's Representative approval before proceeding with the work.
- C. Examine drawings of all disciplines to determine where work of other trades will or is likely to require relocation of existing systems. Remove and relocate electrical equipment in the way of work of other trades. Exact relocation requirement of existing systems to remain to be based on detailed coordination with other trades. Contractor to provide proposed locations of relocated devices to Owner's Representative for approval prior to commencement of work.
- D. Relocation of any system shall be permanent.

3.4 WORK OUTSIDE OF REMODEL AREAS

- A. Provide new wiring systems in concealed ceiling spaces, unless the structure is open to the floor below.
- B. Route wiring around obstructions and provide pull boxes per code. Carefully remove, store, or temporarily hang and re-install in undamaged condition all electrical equipment, lighting fixtures,

and ceiling tiles where access to perform work is required. Clean prior to re-installation. Provide new lamps when so noted.

3.5 NEW DEVICES IN REMODEL AREAS

- A. Provide flush mounting for devices in existing walls. Fish conduit in wall. Where existing boxes are indicated to be reused, extend box as necessary and provide new devices and plates.

END OF SECTION 260510

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Conductors and Cables.
 - 1. Copper Conductors
 - 2. Conductor Insulation
- B. Connectors and Splices.

1.2 GENERAL REFERENCES

- A. Contract Documents: Refer to complete set of Contract Documents for requirements that are related to or may affect the work described in this Section.

1.3 REFERENCE STANDARDS

- A. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.
- B. UL 486A-486B - Wire Connectors.

1.4 SUBMITTALS

- A. Action Submittals
 - 1. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

1.5 COORDINATION

- A. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
- B. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
- C. Notify Owner's Representative of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers:

1. General Cable Corporation.
 2. Alpha Wire
 3. Southwire Company.
 4. Encore Wire Corporation
- B. Copper Conductors: Comply with NEMA WC 70.
- C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers:
1. Atkore (AFC Cable Systems)
 2. Hubbell Power Systems, Inc.
 3. Emerson (O-Z/Gedney; EGS Electrical Group LLC.)
 4. 3M; Electrical Products Division.
 5. TE Connectivity (Tyco Electronics Corp.)
 6. ABB (Thomas & Betts)
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material type, and class for application and service indicated.
- C. Push in connectors shall not be provided.

PART 3 EXECUTION

3.1 APPLICATION

- A. All Applications
1. All conduit and conductor sizes within the project are designed around copper conductors unless noted otherwise in the drawing. Any conductor that does not indicate Copper or Aluminum should be assumed Copper.
 2. Feeders: Stranded.
 3. Branch Circuits: Solid for conductors #10AWG and smaller, stranded for conductors #8AWG and larger
 4. Lugs for equipment provided by the Electrical Contractor shall be Aluminum and Copper rated.
 5. Minimum Conductor Sizes:
 - a. Feeders and Branch Circuits: No. 12 AWG.
 - b. Class 1 Control Circuits: No. 14 AWG.
 - c. Class 2 Control Circuits: No. 16 AWG.
 6. Lugs and splicing accessories utilized shall be compression type. Bolted flat surface connections, (such as between lug and bus bar or bus bar and bus bar) shall utilize compression washers generally referred to as "Belleville" washers. Compression type

fittings shall be total peripheral type, providing complete high pressure contact around entire circumference of conductor.

- a. Note that use of the specified lugs may require increased gutter spaces and wiring spaces in equipment within which such devices are to be utilized. Provide necessary increase in gutter and wiring spaces as required to accommodate specified lugs. UL/ULC listing shall not be violated by required modifications, but shall be re-affirmed in all cases where necessary to validate listing.

7. Set screw type lugs shall not be utilized.

B. Conductor Insulation Applications and Wiring Methods

1. Exposed Feeders: Type THHN, single conductors in raceway.
2. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN, single conductors in raceway.
3. Branch Circuits Concealed in Inaccessible Ceilings, Walls, and Partitions: Type THHN, single conductors in raceway.
4. Branch Circuits in Accessible Ceiling Spaces: Type THHN, single conductors in raceways.
5. Type Metal Clad (MC) Cable in lengths 1800 mm (6 feet) or less and for use as a main / sub connection between light fixtures.
6. Branch Circuits Gypsum-Board Partitions: Type THHN, single conductors in raceways.
7. Class 1 Control Circuits: Type THHN, in raceway.
8. Class 2 Control Circuits: Type THHN, in raceway, Power-limited cable, concealed in building finishes (not allowed in exposed ceiling of finished spaces), or Power-limited tray cable, in cable tray.

C. Voltage Drop

1. Voltage drop shall not exceed two percent for feeder conductors.
2. Voltage drop shall not exceed three percent for branch conductors.

3.2 INSTALLATION

- A. For circuits that require a neutral conductor, provide a dedicated neutral back to the panelboard unless otherwise indicated in design drawings.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, which will not damage cables or raceway.
- D. Identify and color-code conductors and cables according to Section 260553 - Identification for Electrical Systems.
- E. Do not install conductors supplied from different panelboards, distribution panels, or switchboards in same conduit or raceway, unless otherwise noted.
- F. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

- G. Install cables parallel and perpendicular to surfaces of structural members, and follow surface contours where possible.
- H. Do not route cables directly into through panelboards, switchboards, motor starting equipment and similar equipment, as part of the cable pathway.
- I. Support cables according to 260529 - Hangers and Supports for Electrical Systems.
- J. Firestopping
 - 1. Penetrate fire barriers, smoke barriers, vapor barriers, roofing materials and other rated architectural elements in a manner that preserves the rating fo the architectural element.
 - 2. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07.

3.3 CONNECTIONS

- A. Electrical Connections
 - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in .
 - 2. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 3. Wiring at Outlets: Install conductor at each outlet, with at least 150 mm (6 inches) of slack.

3.4 FIELD QUALITY CONTROL

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than -10 degrees C (14 degrees F), unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Owner's Representative and obtain direction before proceeding with work.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Support, Anchorage, and Attachment Components.
 - 1. Steel Slotted Support Systems (Adjustable and Fixed Length)
 - 2. Raceway and Cable Supports
 - 3. Conduit and Cable Support Devices
 - 4. Structural Steel for Fabricated Supports and Restraints
 - 5. Mounting, Anchoring, and Attachment Components

1.2 GENERAL REFERENCES

- A. Contract Documents: Refer to complete set of Contract Documents for requirements that are related to or may affect the work described in this Section.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- B. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength.
- C. MFMA-4 - Metal Framing Standards Publication.
- D. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation.
- E. MSS SP-69 - Pipe Hangers And Supports - Selection And Application.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- G. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT).
- H. NFPA 70 - National Electrical Code.

1.4 SUBMITTALS

- A. Action Submittals
 - 1. Product Data: Provide manufacturer's standard catalog pages and data sheets for all products
 - 2. Shop Drawings: Include details for fabricated hangers and supports where materials or methods other than those indicated are proposed for substitution.
 - 3. Evaluation Reports: For products specified as requiring evaluation and recognition by ICC Evaluation Service, LLC (ICC-ES), provide current ICC-ES evaluation reports upon request.
 - 4. Installer's qualification statement.

5. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications for Powder-Actuated Fasteners: Certified by fastener system manufacturer with current operator's license.

1.6 COORDINATION

- A. Coordinate sizes and arrangement of supports and bases with actual equipment and components to be installed.
- B. Coordinate work to provide additional framing and materials required for installation.
- C. Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.
- D. Coordinate arrangement of supports with ductwork, piping, equipment and other potential conflicts.
- E. Notify Owner's Representative of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

PART 2 PRODUCTS

2.1 SUPPORT, ANCHORAGE AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems (Adjustable and Fixed Length): Comply with MFMA-4, factory-fabricated components for field assembly.
 1. Manufacturers:
 - a. Allied Tube & Conduit.
 - b. Eaton B-Line; formerly Cooper B-Line
 - c. ERICO (nVent).
 - d. GS Metals (Eaton)
 - e. Thomas & Betts Corporation.
 - f. Unistrut; (Atkore)
 - g. Wesanco ZSI
 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 3. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M, steel plates, shapes, and bars; black and galvanized.

- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened Portland cement concrete, steel or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Manufacturers:
 - 1) Eaton B-Line; formerly Cooper B-Line
 - 2) Empire Bolt & Screw
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M
 6. Toggle Bolts: All-steel springhead type.
 7. Hanger Rods: Threaded steel.

PART 3 EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 as well as the NFPA 70 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where it's Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 6 mm (1/4 inch) in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 1. Secure raceways and cables to these supports with clamps approved for the application by an agency acceptable to the authorities having jurisdiction.

3.2 INSTALLATION

A. Support, Anchorage and Attachment Components

1. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
2. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
3. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
4. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code: Engineer
 - a. To Wood: Fasten with lag screws or through bolts.
 - b. To New Concrete: Bolt to concrete inserts.
 - c. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - d. To Existing Concrete: Expansion anchor fasteners.
 - 1) Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 100 mm (4 inches) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 100 mm (4 inches) thick.
 - e. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 - f. To Light Steel: Sheet metal screws.
 - g. Items mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
5. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.
6. Adjustable length slotted steel supports shall be clamped to a fixed length, per manufacturer's instructions to maintain weight support restrictions recommended by the manufacturer.

END OF SECTION 260529

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal Conduit and Tubing.
- B. Boxes, Enclosures, and Cabinets.

1.2 GENERAL REFERENCES

- A. Contract Documents: Refer to complete set of Contract Documents for requirements that are related to or may affect the work described in this Section.

1.3 REFERENCE STANDARDS

- A. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S).
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction.
- C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable.
- E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- F. NFPA 70 - National Electrical Code.

1.4 SUBMITTALS

- A. Action Submittals
 - 1. Product Data: For metal conduit and tubing and sheet metal boxes.

1.5 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Manufacturers:
 - 1. AFC Cable Systems, Inc. (Atkore)
 - 2. Alfex (Southwire)
 - 3. Allied Tube & Conduit; (Atkore)
 - 4. Anamet Electrical, Inc.; Anaconda Metal Hose.

5. Electri-Flex Co.
 6. Manhattan/CDT/Cole-Flex.
 7. Maverick Tube Corporation.
 8. O-Z Gedney; a unit of General Signal.
 9. Wheatland Tube Company.
 10. Thomas & Betts
- B. EMT: ANSI C80.3.
1. ANSI C80.3 american national standard for electrical metallic tubing steel
- C. FMC: Zinc-coated steel.
- D. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
1. Fittings for EMT: set screw or compression type.
 2. Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with the provided raceways as required for complete system.

2.2 BOXES, ENCLOSURES AND CABINETS

- A. Manufacturers:
1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
 2. EGS/Appleton Electric.
 3. Erickson Electrical Equipment Company.
 4. Hoffman.
 5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
 6. Legrand Wiremold
 7. O-Z/Gedney; a unit of General Signal.
 8. RACO; a Hubbell Company.
 9. Robroy Industries, Inc.; Enclosure Division.
 10. Scott Fetzer Co.; Adalet Division.
 11. Spring City Electrical Manufacturing Company.
 12. Thomas & Betts Corporation.
 13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1, one piece cold drawn type, welded boxes are not acceptable.
1. NEMA OS 1 Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports
- C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

- D. Dividers: Provide listed dividers inside multi-gang boxes where required to separate phases.
- E. Metal barriers to separate wiring of different systems and voltages exceeding 150V.
- F. Hinged-Cover Enclosures: NEMA EN 10250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

PART 3 EXECUTION

3.1 APPLICATION

- A. Indoors: Apply raceway products as specified below, unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 3. Boxes and Enclosures: NEMA EN 10250, Type 1, except use NEMA EN 10250, Type 4, stainless steel in damp or wet locations.
- B. Minimum Raceway Size: 3/4 inch trade size.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 200 mm (8 inches) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Install raceways parallel to building lines.
- D. Install raceway expansion fittings at building expansion joints, parallel to building lines.
- E. Complete raceway installation before starting conductor installation.
- F. Support raceways as specified in Section 260529 - Hangers and Supports for Electrical Systems.
- G. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- H. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- I. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- K. Provide insulating and grounding bushings at junction boxes, outlet boxes, and cabinets for conduits 27 mm (1-inch) and larger in diameter.

- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 300 mm (12 inches) of slack at each end of pull wire.
- N. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where otherwise required by code or the AHJ.
- O. Flexible Conduit Connections: Use maximum of 1800 mm (72 inches) of flexible conduit for recessed and semirecessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
- P. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.
- Q. Firestopping
 - 1. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07.

3.3 FIELD QUALITY CONTROL

- A. Provide final protection and maintain conditions that ensure coatings, and finishes are without damage or deterioration at time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION 260533

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Conductor and Communication- and Control-Cable Identification Materials
- B. Equipment Identification Labels

1.2 GENERAL REFERENCES

- A. Contract Documents: Refer to complete set of Contract Documents for requirements that are related to or may affect the work described in this Section.
- B. Common Electrical Requirements in Section 260000 apply to this Section. Requirements noted in this Section are supplemental to the requirements of these General References.

1.3 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.4 COORDINATION

- A. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
 - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
 - 2. Do not install identification products until final surface finishes and painting are complete.

PART 2 PRODUCTS

2.1 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 27 to 53 mm (1 to 2 inches) wide.
- B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

2.2 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 9.5 mm (3/8 inch).

PART 3 EXECUTION

3.1 APPLICATION

- A. Power-Circuit Conductor Identification: For primary and secondary conductors No. 4 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape, marker tape, or write-on tags. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.
- B. Branch-Circuit Conductor Identification: Use marker tape or write-on tags in each junction or pull box. Identify each ungrounded conductor according to source and circuit number.
- C. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and Operation and Maintenance Manual.
- D. Electrical Energy Source Identification Labels: On each unit of equipment, install a unique source and circuit designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manuals. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system.
 - 1. Labeling Instructions:
 - a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 9.5 mm (3/8-inch) high letters on 21 mm (3/4-inch) high label; where 2 lines of text are required, use labels 41 mm (1.5 inches) high.
 - b. Outlet, Device, Pull and Junction Boxes: Apply source and circuit to back of device box cover and to front of pull and junction box covers with indelible ink.
 - 2. Equipment to be Labeled:
 - a. Lighting control equipment.
 - b. Wiring devices boxes.
 - c. Junction and pull boxes.
 - d. Electrical devices (receptacles, switches etc.) shall be labeled with panel and circuit number on the coverplate of the device.

3.2 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device. Where used on electrical equipment and enclosures also use screws to fasten in place.
- E. Attach non-adhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

- F. Fasten signs and labels to electrical equipment and enclosures with screws.
- G. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.
 - 1. Color shall be factory applied or, for sizes larger than No. 6 AWG if authorities having jurisdiction permit, field applied.
 - 2. Colors for 208Y/120-V Circuits (For existing buildings, the Contractor shall field verify and match existing color schemes):
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral: White.
 - e. Ground: Green.
 - 3. Colors for 480/277-V and 347/600-V Circuits (For existing buildings, the Contractor shall field verify and match existing color schemes):
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - d. Neutral: Gray.
 - e. Ground: Green.
 - 4. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- H. Branch and Feeder Circuit Load Identification Labels: On each overcurrent protective device, install unique load designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual.
 - 1. Labeling Instructions:
 - a. Panelboard Circuit Directories: Provide type-written or laser printed circuit directory on heavy card stock. Arrange in two columns with odd numbered circuits on left and even numbered circuits on right. Include panelboard identification and installation date. Indicate spare circuit breakers: "SPARE". Install in metal frame with clear plastic cover. Coordinate with the Owner's final room numbering system.
- I. Independent Support Wire: Where independent support wires are permissible and utilized for securing electrical raceways, cable assemblies, boxes, cabinets, or fittings within ceiling cavities, they shall be distinguishable from ceiling support wires by color, tagging, or other effective means.

3.3 FIELD QUALITY CONTROL

- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

END OF SECTION 260553

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Digital-network lighting control system and associated components:
 - 1. Power interfaces.
 - 2. Control stations.

1.2 RELATED REQUIREMENTS

- A. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

- A. ASTM D4674 - Standard Practice for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Office Environments; 2002a (Reapproved 2010).
- B. CSA C22.2 No. 223 – Power Supplies with Extra-low-voltage Class 2 Outputs; 2015.
- C. IEC 60669-2-1 - Switches for Household and Similar Fixed Electrical Installations - Part 2-1: Particular Requirements - Electronic Switches; 2015.
- D. ISO 9001 - Quality Management Systems-Requirements; 2008.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
- F. NECA 130 - Standard for Installing and Maintaining Wiring Devices; National Electrical Contractors Association; 2010.
- G. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; National Electrical Manufacturers Association; 2015.
- H. NEMA WD 1 - General Color Requirements for Wiring Devices; National Electrical Manufacturers Association; 1999 (R 2015).
- I. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances; Current Edition, Including All Revisions.
- K. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.
- L. UL 508 - Industrial Control Equipment; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
- M. UL 508A - Industrial Control Panels; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
- N. UL 1310 – Class 2 Power Units; Current Edition, Including All Revisions.

- O. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.
- P. UL 2043 - Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces; Current Edition, Including All Revisions.
- Q. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work to provide luminaires and lamps compatible with the lighting controls to be installed.
 - 2. Notify Engineer of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.
- B. Preinstallation Meeting: Conduct on-site meeting with lighting control system manufacturer prior to commencing work as part of manufacturer's standard startup services. Manufacturer to review with installer:
 - 1. Low voltage wiring requirements.
 - 2. Separation of power and low voltage/data wiring.
 - 3. Wire labeling.
 - 4. Control locations.
 - 5. Load circuit wiring.
 - 6. Connections to other equipment.
 - 7. Installer responsibilities.
 - 8. Power panel locations.

1.5 SUBMITTALS

- A. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.
- B. Shop Drawings:
 - 1. Provide schematic system riser diagram indicating component interconnections. Include requirements for interface with other systems.
 - 2. Provide detailed sequence of operations describing system functions.
- C. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- D. Project Record Documents: Record actual installed locations and settings for lighting control system components.
- E. Operation and Maintenance Data: Include detailed information on lighting control system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.

1.6 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications:
 - 1. Company with not less than ten years of experience manufacturing lighting control systems of similar complexity to specified system.
 - 2. Registered to ISO 9001, including in-house engineering for product design activities.
 - 3. Qualified to supply specified products and to honor claims against product presented in accordance with warranty.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.8 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.
 - 1. System Requirements, Unless Otherwise Indicated:
 - a. Ambient Temperature:
 - 1) Lighting Control System Components, Except Those Listed Below: Between 32 and 104 degrees F (0 and 40 degrees C).
 - 2) Lighting Management System Computer: Between 50 and 90 degrees F (10 and 35 degrees C).
 - 3) Fluorescent Electronic Dimming Ballasts: Between 50 and 140 degrees F (10 and 60 degrees C).
 - b. Relative Humidity: Less than 90 percent, non-condensing.

1.9 WARRANTY

- A. Manufacturer's Standard Warranty, With Manufacturer Start-Up:
 - 1. Manufacturer Lighting Control System Components:
 - a. First Two Years:
 - 1) 100 percent replacement parts coverage, 100 percent manufacturer labor coverage to troubleshoot and diagnose a lighting issue.
 - 2) First-available on-site or remote response time.
 - 3) Remote diagnostics for applicable systems.
 - b. Telephone Technical Support: Available 24 hours per day, 7 days per week, excluding manufacturer holidays.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Lutron Electronics Company, Inc
- B. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

2.2 DIGITAL-NETWORK LIGHTING CONTROL SYSTEM - GENERAL REQUIREMENTS

- A. Provide products listed, classified, and labeled by Underwriter's Laboratories Inc. (UL) as suitable for the purpose indicated.
- B. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the control intent indicated.
- C. Design lighting control equipment for 10 year operational life while operating continually at any temperature in an ambient temperature range of 32 degrees F (0 degrees C) to 104 degrees F (40 degrees C) and 90 percent non-condensing relative humidity.
- D. Electrostatic Discharge Tolerance: Design and test equipment to withstand electrostatic discharges without impairment when tested according to IEC 61000-4-2.
- E. Dimming and Switching (Relay) Equipment:
 - 1. Designed so that electrolytic capacitors operate at least 36 degrees F (20 degrees C) below the capacitor's maximum temperature rating when the device is under fully loaded conditions at maximum rated temperature.
 - 2. Inrush Tolerance:
 - a. Utilize load-handling thyristors (SCRs and triacs), field effect transistors (FETs) and isolated gate bipolar transistors (IGBTs) with maximum current rating at least two times the rated operating current of the dimmer/relay.
 - b. Capable of withstanding repetitive inrush current of 50 times the operating current without impacting lifetime of the dimmer/relay.
 - 3. Surge Tolerance:
 - a. Panels: Designed and tested to withstand surges of 6,000 V, 3,000 amps according to IEEE C62.41.2 and IEC 61000-4-5 without impairment to performance.
 - b. Other Power Handling Devices: Designed and tested to withstand surges of 6,000 V, 200 amps according to IEEE C62.41.2 without impairment to performance.
 - 4. Power Failure Recovery: When power is interrupted and subsequently restored, within 3 seconds lights to automatically return to same levels (dimmed setting, full on, or full off) as prior to power interruption.
 - 5. Dimming Requirements:
 - a. Line Noise Tolerance: Provide real-time cycle-by-cycle compensation for incoming line voltage variations including changes in RMS voltage (plus or minus 2 percent change in RMS voltage per cycle), frequency shifts (plus or minus 2 Hz change in frequency per second), dynamic harmonics, and line noise.
 - 1) Systems not providing integral cycle-by-cycle compensation to include external power conditioning equipment as part of dimming system.
 - b. Incorporate electronic "soft-start" default at initial turn-on that smoothly ramps lights up to the appropriate levels within 0.5 seconds.
 - c. Utilize air gap off to disconnect the load from line supply.

- d. Control all light sources in smooth and continuous manner. Dimmers with visible steps are not acceptable.
 - e. Load Types:
 - 1) Assign a load type to each dimmer that will provide a proper dimming curve for the specific light source to be controlled.
 - 2) Provide capability of being field-configured to have load types assigned per circuit.
 - f. Minimum and Maximum Light Levels: User adjustable on a circuit-by-circuit basis.
 - g. Line Voltage Dimmers:
 - 1) Dimmers for Magnetic Low Voltage (MLV) Transformers:
 - a) Provide circuitry designed to control and provide a symmetrical AC waveform to input of magnetic low voltage transformers per UL 1472.
 - b) Dimmers using unipolar load current devices (such as FETs or SCRs) to include DC current protection in the event of a single device failure.
 - 2) Dimmers for Electronic Low Voltage (ELV) Transformers: Operate transformers via reverse phase control. Alternately, forward phase control dimming may be used if dimming equipment manufacturer has recommended specific ELV transformers being provided.
 - 3) Dimmers for Neon and Cold Cathode Transformers:
 - a) Magnetic Transformers: Listed for use with normal (low) power factor magnetic transformers.
 - b) Electronic Transformers: Must be supported by the ballast equipment manufacturer for control of specific ballasts being provided.
 - h. Low Voltage Dimming Modules:
 - 1) Coordination Between Low Voltage Dimming Module and Line Voltage Relay: Capable of being electronically linked to a single zone.
 - 2) Single low voltage dimming module; capable of controlling the following light sources:
 - a) 0-10V analog voltage signal.
 - (1) Provide Class 2 isolated 0-10V output signal conforming to IEC 60929.
 - (2) Sink current according to IEC 60929.
 - (3) Source current.
 - b) 10-0V reverse analog voltage signal.
 - c) DSI digital communication.
 - d) DALI broadcast communication per IEC 60929:
 - (1) Logarithmic intensity values complying with IEC 60929.
 - (2) Linear intensity values for use with LED color intensity control.
 - e) PWM per IEC 60929.
6. Switching Requirements:
- a. Rated Life of Relays: Typical of 1,000,000 cycles at fully rated 16 A for all lighting loads.
 - b. Switch load in a manner that prevents arcing at mechanical contacts when power is applied to and removed from load circuits.
 - c. Provide output fully rated for continuous duty for inductive, capacitive, and resistive loads.

F. Device Finishes:

1. Wall Controls: To be selected by Architect.
2. Standard Colors: Comply with NEMA WD1 where applicable.
3. Color Variation in Same Product Family: Maximum delta E of 1, CIE L*a*b color units.
4. Visible Parts: Exhibit ultraviolet color stability when tested with multiple actinic light sources as defined in ASTM D4674. Provide proof of testing upon request.

G. Interface with Existing Work: All lighting controls shall operate as an extension of the existing building Lutron Quantum System.

2.3 POWER INTERFACES

A. Provide power interfaces as indicated or as required to control the loads as indicated.

B. General Requirements:

1. Phase independent of control input.
2. Rated for use in air-handling spaces as defined in UL 2043.
3. Utilize air gap off to disconnect the load from line supply.
4. Diagnostics and Service: Replacing power interface does not require re-programming of system or processor.

C. Product(s):

1. Ten Volt Interface: Provides interface for phase control input to provide full 16 A circuit output of switching and 0-10 V low voltage control for compatible fluorescent electronic dimming ballasts or LED drivers.

2.4 CONTROL STATIONS

A. Provide control stations with configuration as indicated or as required to control the loads as indicated.

B. Wired Control Stations:

1. General Requirements:

- a. Power: Class 2 (low voltage).
- b. UL listed.
- c. Provide faceplates with concealed mounting hardware.
- d. Borders, logos, and graduations to use laser engraving or silk-screened graphic process that chemically bonds graphics to faceplate, resistant to removal by scratching and cleaning.
- e. Finish: As specified for wall controls in "Device Finishes" under DIGITAL-NETWORK LIGHTING CONTROL SYSTEM - GENERAL REQUIREMENTS article above.

2. Multi-Scene Wired Control:

a. General Requirements:

- 1) Allows control of any devices part of the lighting control system.
- 2) Allows for easy reprogramming without replacing unit.
- 3) Replacement of units does not require reprogramming.

- 4) Communications: Utilize RS485 wiring for low-voltage communication.
- 5) Software Configuration:
 - a) Customizable control station device button functionality:
 - (1) Buttons can be programmed to perform single defined action.
 - (2) Buttons can be programmed to perform defined action on press and defined action on release.
 - (3) Buttons can be programmed using conditional logic off of a state variable such as time of day or partition status.
 - (4) Buttons can be programmed to perform automatic sequence of defined actions.
 - (5) Capable of deactivating select keypads to prevent accidental changes to light levels.
 - (6) Buttons can be programmed for raise/lower of defined loads.
 - (7) Buttons can be programmed to toggle defined set of loads on/off.
 - 6) Status LEDs:
 - a) Upon button press, LEDs to immediately illuminate.
 - b) LEDs to reflect the true system status. LEDs to remain illuminated if the button press was properly processed or LEDs to turn off if the button press was not processed.
 - c) Support logic that defines when LED is illuminated:
 - (1) Scene logic (logic is true when all zones are at defined levels).
 - (2) Room logic (logic is true when at least one zone is on).
 - (3) Pathway logic (logic is true when at least one zone is on).
 - (4) Last scene (logic is true when spaces are in defined scenes).
- b. Wired Keypads:
 - 1) Communications: Utilize RS485 wiring for low-voltage communications link.
 - 2) Mounting: Wallbox or low-voltage mounting bracket; provide wall plates with concealed mounting hardware.
 - 3) Button/Engraving Backlighting:
 - a) Utilize backlighting for buttons and associated engraving to provide readability under all light conditions.
 - b) Backlight intensity adjustable via programming software.
 - 4) Design keypads to allow field-customization of button color, configuration, and engraving using field-changeable replacement kits.
 - 5) Contact Closure Interface: Provide two contact closure inputs on back of unit which provide independent functions from front buttons; accepts both momentary and maintained contact closures.
 - 6) Terminal block inputs to be over-voltage and miswire-protected against wire reversals and shorts.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that ratings and configurations of system components are consistent with the indicated requirements.

- B. Verify that mounting surfaces are ready to receive system components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

- A. Perform work in a neat and workmanlike manner in accordance with NECA 1 and, where applicable, NECA 130.
- B. Install products in accordance with manufacturer's instructions.
- C. Define each dimmer/relay load type, assign each load to a zone, and set control functions.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Startup Services:
 - 1. Manufacturer's authorized Service Representative to conduct minimum of two site visits to ensure proper system installation and operation.
 - 2. Conduct Pre-Installation visit to review requirements with installer as specified in Part 1 under "Administrative Requirements".
 - 3. Conduct site visit upon completion of lighting control system to perform system startup and verify proper operation:
 - a. Verify connection of power wiring and load circuits.
 - b. Verify connection and location of controls.
 - c. Energize lighting management hubs and download system data program.
 - d. Address devices.
 - e. Verify proper connection of panel links (low voltage/data) and address panel.
 - f. Download system panel data to dimming/switching panels.
 - g. Check dimming panel load types and currents and supervise removal of by-pass jumpers.
 - h. Verify system operation control by control.
 - i. Verify proper operation of manufacturer's interfacing equipment.
 - j. Train Owner's representative on system capabilities, operation, and maintenance, as specified in Part 3 under "Closeout Activities".
 - k. Obtain sign-off on system functions.
- B. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.

3.4 CLOSEOUT ACTIVITIES

- A. Demonstration:
 - 1. On-Site Performance-Verification Walkthrough: Include additional costs for Lighting Control Manufacturer to provide on-site demonstration of system functionality to facility representative.
- B. Training:

1. Include services of manufacturer's authorized Service Representative to perform on-site training of Owner's personnel on operation, adjustment, and maintenance of lighting control system as part of standard system start-up services.

3.5 PROTECTION

- A. Protect installed products from subsequent construction operations.

END OF SECTION 260943

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Contract Drawings, conditions of Contract (including General Conditions, Addendum to the General Conditions, Special Conditions, Division 01 Specification Sections and all other Contract Documents) apply to the work of this Section.
- B. Related Sections: Division 26, and Section 26 09 26 "Lighting Controls" and Section 26 09 93 "Sequence of Operations for Lighting Controls" are related to this Section.
- C. Related Appendices Luminaire Schedule and Catalogue Extracts are attached as appendices to this Section.

1.2 SUMMARY

- A. Included in the Work of this Section are labor, materials, and appurtenances required to complete the Work of this Section, as specified herein, as required by job conditions, or as indicated on drawings. The scope of this section includes general requirements for luminaires and their components, coordination, definitions, quality assurances, submittals, mockups, samples and general responsibility for a complete job.

1.3 DEFINITIONS

- A. In this specification, the term "Architect" includes the Architect, Interior Designer, Landscape Architect, Construction Manager, Owner's representative and/or the Lighting Specifier, together or individually as they shall decide.
- B. The term "luminaires" refers to lighting fixtures with their integrated light sources and all other components.
- C. The use of the word "Approved" shall not extend the Architect's responsibilities beyond that as defined in the General Conditions.

1.4 GENERAL REQUIREMENTS

- A. Provide labor, materials, and equipment for the installation of indoor luminaires, lighting equipment, control wiring, and sources as shown on the drawings and specified herein and in Related Sections. Luminaires shall be securely attached to supports.
- B. Refer to architectural drawings for locations, dimensions and details, and electrical documents for quantities. Check and verify dimensions and details on drawings before proceeding with the Work. Report any inconsistencies or discrepancies. Should it appear that the Work intended is not sufficiently detailed or explained on the drawings or in the specifications, apply for further drawings or explanations, as may be necessary. Conform to these explanations in the work. If any question arises about the true meaning of the drawings or specifications, provide timely and written questions before proceeding. Under no circumstances shall any request for extra

compensation be honored where the basis of claim is such a clarification. In no case submit a bid or proceed on any Work with uncertainty. The intention of this specification and the accompanying or applicable drawings is to provide a job complete in every respect. Contractor is responsible for this result.

- C. Recycling and Disposal: Existing luminaires shall be removed as directed by scope of work. Proper disposal of components, including but not limited to fluorescent lamps and ballasts containing mercury, PCBs or other toxic materials, shall be conducted according to relevant Federal, State, Local, and EPA regulations or guidelines. Provide written verification of proper disposal. Electronic components shall be recycled as electronic equipment, or as otherwise required by relevant codes or local laws.

1.5 COORDINATION

- A. Luminaire locations and mounting heights as indicated on the electrical drawings are generalized and approximate. Carefully verify locations and mounting heights with Architect's drawings, reflected ceiling plans, interior elevations and other reference data prior to installation. Check for adequacy of headroom and non-interference with other equipment, such as ducts, pipes or openings. Provide timely and written notification of such conflicts before proceeding with the Work. Although the location of equipment included in the Work of this Section may be shown on the Contract Drawings in a certain place, actual construction may disclose that the location for the Work does not make its position easily and quickly accessible. In such cases, provide timely and written notification of this situation before installing this Work, and comply with installation directions.
- B. Clearly indicate the Work to be performed by other trades' contractors, and the materials that are adjacent to or abutting the Work of this Section. Coordinate as required. Give ample notice of special openings required for placing equipment in the building, in order to avoid cutting of completed Work. Provide the materials and labor for Work included under this Section in ample time, and in sufficient quantities so that all of the Work may be installed in proper sequence to avoid unnecessary cutting of the floors and walls. Schedule the Work to prevent Work of this Section being damaged by other construction operations. Remove and replace Work so damaged at no cost to the project. Coordinate and schedule the Work of this Section with the Work of other Sections and Utility Companies so that there shall be no delay in the proper installation and completion of any part of each respective Work. Construction Work shall proceed in its natural sequence without unnecessary delay caused by the Work of this Section.
- C. Coordinate with other contractors regarding attachment to or openings in the materials of other trades such as pre-cast concrete, ornamental metals, or wood panels for recessed junction boxes, and other equipment.
- D. Arrange the installation in proper relation to other Work and with architectural finishes so that it shall harmonize in service and appearance and so that there shall be no interference with the Work of others, including interference in location or level.
- E. Where a catalog number and a narrative or pictorial description are provided, the written description shall take precedence and prevail.
- F. Where Work of this Section is to be flush or concealed, install it to assure that it does not project visually or physically beyond the finished lines of floors, ceilings or walls.
- G. Verify ceiling conditions and provide appropriate mounting details for each luminaire. Submit mounting details for approval.

- H. Become familiarized with all equipment listed in the luminaire schedule and take responsibility for the successful completion of the entire lighting installation.
- I. Verify compatibility of supply voltage indicated on electrical drawings with voltage specified for each luminaire prior to release. Provide timely and written notification of any and all discrepancies.
- J. Integration: Provide the services of a lighting controls "Integrator", to ensure the successful coordination and performance of complex lighting systems such as digital addressable luminaires, sensors integrated into luminaires, dynamic lighting controls, DMX, scenes, shows, color-tuning and the like meets all the performance criteria of these contract document. Integrator shall view the contract documents, coordinate between disciplines, preview and review the shop drawing submittals, and commission the lighting system according to the contract documents.

1.6 QUALITY ASSURANCES

- A. Contractor shall comply with the General Requirements related to Quality Control, in addition to the provisions herein
- B. Manufacturers: Manufacturers listed in the APPENDIX – LUMINAIRE SCHEDULE (lighting fixture schedule) herein, shall be assumed capable of supplying the listed luminaires unless exceptions are set forth in their quotations. Provide timely and written notification of any such exceptions. Acceptable manufacturers are listed in the luminaire schedule. Acceptable manufacturers shall be capable of providing proof of satisfactory production of luminaires of the type and quality shown for a period of at least five years.
- C. Statement of Application:
 - 1. By commencing the Work of this Section, the Contractor assumes overall responsibility, as a part of the warranty of the Work, to ensure that assemblies, components and parts shown or required within the Work of this Section, comply with the Contract Documents.
 - 2. Warranty: In addition to any warranties required by the General Requirements, the Contractor of the Work of this section shall:
 - a. For a period of one year after Owner's initial acceptance and establishment of the beginning date of the warranty period, and at no additional cost, promptly provide and install replacements for luminaires or components thereof which are defective in materials or workmanship under normal operating conditions, except for sources; or successfully repair installed equipment at the job site. For any time during the warranty period that luminaires are not fully functional due to defects in materials or workmanship, provide or pay for and install and remove suitable and adequate temporary luminaires. Warrant replacement luminaires or components to be free of defects in workmanship or materials for a period of one year following replacement and replace any defective replacements.
 - b. Contractor shall not be held responsible for acts of vandalism or for abnormal or accidental abuse of the luminaires or their components occurring after the beginning of the warranty period, nor shall Contractor be held responsible for deleterious effects caused by maintenance procedures performed without the concurrence of Contractor.
- D. Equipment Compatibility:
 - 1. For all similar luminaire type, provide luminaires, power supplies, LED drivers, ballasts and other components fabricated or supplied by a single manufacturer, to simplify maintenance and replacement of equipment. Under no circumstances shall sources of the same type, even if different wattages, be supplied by more than one manufacturer unless operable samples are submitted, reviewed and approved in writing.

2. Luminaire details shown may be modified by the manufacturer provided all of the following conditions have been met:
 - a. Luminaire performance is equal or improved.
 - b. Structural, mechanical, electrical, safety, and maintenance characteristics are equal or improved.
 - c. Cost to the Owner is reduced or equal.
 - d. No conformance to codes has been compromised.
 - e. No performance criteria for, LEED, or WELL Building ratings has been compromised.
 - f. Modifications have been reviewed and approved in writing.
 - E. Regulatory Agencies:
 1. Provide luminaires constructed, wired and installed in compliance with the current edition of applicable city, state and national codes. Provide luminaires conforming to or exceeding Underwriters Laboratories (UL) standards, and to provisions of applicable codes which exceed those standards.
 2. For any category of luminaire tested by any of the following labs, provide luminaires listed and labeled by an independent Nationally Recognized Testing Laboratory (NRTL) such as UL, ETL, CSA, MET
 3. In addition, provide luminaires which conform to additional regulations necessary to obtain approval for use of specified luminaires in locations shown. Use only electrical components listed by the above NRTLs.
 - F. Recognized Standards: In addition to standards that may be referenced in Division 01 Specification Sections, luminaires shall comply with the applicable standards of the following organizations.
 1. Underwriters Laboratories (UL)
 2. National Electrical Code (NEC)
 3. Certified Ballast Manufacturers Association (CBM)
 4. Illuminating Engineering Society (IES)
 5. American Society for Testing and Materials (ASTM)
 6. American National Standards Institute (ANSI)
 7. National Electrical Manufacturers Association (NEMA)
 8. International Electrotechnical Commission (IEC)
 9. National Electrical Safety Code (IEEE C2)
 10. Americans with Disabilities Act (ADA)
 11. 2021 Washington State Energy Code (WSEC)
 12. Intertek (ETL)
- 1.7 BIDDING
- A. Follow bidding procedures as described in Division 01 of this specification.
 - B. Provide specified and alternate unit prices separated from installation costs as required in APPENDIX - LUMINAIRE SCHEDULE (the lighting fixture schedule).
- 1.8 SUBSTITUTIONS:
- A. Luminaires included under this Section are specified by approved manufacturer and type. Provide equipment exactly as specified, unless substitutions are mutually agreed upon, as follows:

1. Any proposed substitutions must be accompanied by full point-by-point calculations and auxiliary documentation demonstrating that the proposed luminaires fully meet the criteria in each specific application.
2. Substitutions will only be considered for luminaire descriptions where the words "or approved equal" are explicitly stated.
3. Submit a written request for luminaires proposed for substitution, at least two weeks before the end of bid period – the "substitution period". Make the request for substitution an alternate, separate proposal, accompanied by complete descriptive and technical data. Indicate if there is any addition or deduction from the base bid. Substitutions proposed after this time, or not including proper documentation shall not be considered. Submissions of substitutions may be accepted or rejected without explanation.
4. Exceptions: During the construction period, no substitutions shall be considered unless compelling reasons are given - such as a specified product no longer being available. If Contractor has failed to follow the schedule presented under the Paragraph titled "Submittals" below, no substitutions will be allowed based on inability of specified manufacturer to meet delivery schedule, and the Contractor shall provide luminaires exactly as specified without delay to the project and without additional cost to Owner.
5. Substitutions shall be indicated as such in the bid documents, and operable (plug-in) samples, catalogue cuts and complete photometric reports by independent testing laboratories submitted. A complete comparison of the performance of the proposed substitution in relation to the performance of at least the first named specified product shall be included. In addition, for any luminaire type of which six (6) or more of the luminaires are to be used, submit computer generated point-by-point calculations for illumination on vertical and horizontal planes. Such calculations shall include either the typical mounting condition for the subject luminaire or a specialized mounting condition deemed critical for the success of the design.
6. Written documentation shall clearly show that the proposed manufacturer complies with each and every aspect of the specification and/or indicate any exceptions or variations. Where proposed substitutions alter the functional or visual design or change the space requirements or mounting details indicated herein or on the drawings, such changes shall be detailed in the proposal and costs indicated for revised design and construction for trades involved. Cost data shall be provided as called for in the General Requirements. Submittal shall include names and addresses of at least three (3) similar projects on which the product was used, including names and phone numbers of specifiers and owners of each project, and dates of installation.

B. Value Engineering:

1. To the extent that Value Engineering is allowed in the General Requirements, the procedure for value engineering is the same as outlined above regarding the substitution process, with the words "value engineering proposed substitution(s)" replacing the word "substitution(s)". Value engineering submittals shall be clearly separated from substitutions, and line-item cost savings for each proposed luminaire type clearly documented.

1.9 SUBMITTALS

A. General:

1. For standard catalog items with no modifications, submit catalog cut sheets prepared by the manufacturer which clearly show all elements to be supplied and all corresponding product data (including sources, manufacturer and model number of power supply, LED driver, ballast, and other components, as well as voltage; accessories, options and any miscellaneous items detailed in the written description of the specification.) If cut sheet

- shows more than one (1) luminaire type, all non-applicable information shall be crossed out.
2. For custom luminaires, modified luminaires or linear luminaires mounted in continuous rows, submit a layout drawing prepared by the manufacturer showing all details of construction, lengths of runs, source layout, if applicable, suspension installation hardware or components, power locations, remote power supplies, remote LED drivers, remote ballasts, remote transformers, finishes and list of materials. Drawings must be to scale. Provide manufacturer with field dimensions where required. If scallop shields, wallwash reflectors or baffles are required, drawings shall indicate relative position to wall or adjacent vertical surface.
 3. When components are indicated as contractor supplied or specified (i.e. remote power supplies, remote LED drivers, ballast housings, NEMA enclosures, etc., provide submittals for components in conjunction with the luminaire submittal.
 4. Provide submittals with luminaire installation instruction sheets.
- B. Submittal Schedule (Note: All days, week or months listed are "calendar" days, weeks or months, and not working days, weeks or months):
1. List of Intended Manufacturers: Within fifteen (15) calendar days of the Notice to Proceed, submit a List of Intended Manufacturers, with estimated fabrication lead times. "Lead times" shall be measured in weeks, beginning from the manufacturer's receipt of approved shop drawings and release, and ending at shipment. The response to this list will indicate if any manufacturers are unacceptable.
 2. Acknowledgments and standard shop drawings: Within twenty (20) days after receipt of the response to the list of Intended Manufacturers, submit copies of purchase orders and manufacturers' acknowledgments for all luminaires specified, conforming to responses. The purchase orders and the manufacturer's acknowledgments need not list prices, but shall contain a guaranteed fabrication lead time, in weeks, as defined above. These fabrication times shall be adequate for the timely completion of the job. At the same time, but not less than twenty-four (24) weeks before standard manufactured luminaires are required on the site, submit shop drawings for all standard luminaires or those with minor modifications.
 3. Custom Shop Drawings: In order to allow for mockups and independent testing for all custom luminaires or those with major modifications, submit complete shop drawings within sixty (60) days after the Notice to Proceed, but not less than eleven (11) months prior to the time they are required on the site.
 4. Release for fabrication: Within twenty (20) days after receipt of shop drawings marked "No Exceptions Taken" or "Make Corrections Noted", release luminaires for fabrication and forward verification that the luminaires have been released for fabrication, with a guaranteed shipment date for each specified luminaire. At the same time, forward finish or component samples, tests, or any outstanding data required for approval.
 5. Operable luminaire samples and mockups as indicated in APPENDIX - LUMINAIRE SCHEDULE (the lighting fixture schedule) shall be received by the designated parties, or installed on the site, within forty-five (45) days after Contractor's receipt of shop drawings marked "No Exceptions Taken" or "Make Corrections Noted".
 6. Re-submissions: Within fourteen (14) days after receipt of shop drawings marked "Revise and Resubmit" or "Rejected", resubmit revised shop drawings in accordance with the General Requirements regarding re-submissions.
 7. Provide written notification of any potential scheduling problems, or of any submittals that have not been returned which are required to maintain the installation schedule. Such notification shall be in a timely manner and well in advance of the time such delay might affect the fabrication schedule or appropriate delivery of luminaires.
 8. Request for Final Layout: At the same time that shop drawings are submitted, request verification of final layouts and control zones for all luminaires. Submit templates for labeling of all controls. Layout adjustments shall be considered no-cost clarification as long

as the quantity or value of luminaires does not increase. Provide blank control station faceplates until labels are available. Custom engraved or labeled faceplates shall be ordered from the manufacturer so that they arrive prior to the final release of the space and subsequent beginning of the warranty period. Blank faceplates shall be replaced with custom labeled faceplates at no additional cost to the project.

C. Shop Drawings:

1. Submit shop drawings for each type of luminaire, arranged in order of lighting type designation except where specified luminaires are standard, unmodified, "off-the-shelf" units, fully described by catalogue cuts. If comprehensive, such catalogue cuts may be substituted for shop drawings, however full shop drawing shall be submitted upon request. Submit catalogue cuts of individual lamps or replaceable source modules to be provided for each luminaire. Submit shop drawings in the quantity and format called for in the General Requirements.
2. Shop drawings shall show all luminaire components, including but not limited to lampholders, reflectors, louvers, lenses, fuses, junction boxes, power supplies, ballasts and sources. Shop drawings shall show materials, finishes, metal gauges, overall and detailed dimensions, sizes, electrical and mechanical connections, fasteners, welds, joints, any exposed hardware, and conditions, or provisions for the work of others, and similar information. Indicate complete details of the luminaire, including manufacturer's name and catalogue numbers for sockets, power supplies, LED drivers, ballasts, light shields, switches and type of wiring, and targeting and locking devices for adjustable luminaires. Indicate that source type specified is appropriate for luminaire design. Indicate maximum allowed distance between light luminaire and remote power supply. Indicate type and extent of approved inert insulating materials to prevent electrolytic corrosion at junctions of dissimilar metals. Include pertinent mounting details including hung ceiling construction. Standard catalogue cuts shall be supplemented by additional drawings if information or descriptions listed above are not included in the cuts. Photometric documentation and finish samples shall be provided upon request. Samples shall be provided if indicated in APPENDIX - LUMINAIRE SCHEDULE (the lighting fixture schedule). No luminaires will be approved without the previous described submission of data. Submissions may be modified during the submission review process. Luminaires or other materials shall not be fabricated, shipped, stored or installed unless prior written approval has been received.
3. Submit layouts for continuous luminaires or coves, indicating overall field measurements and proposed lengths, and condition of joints, corners, ends and any unlighted lengths.
4. Submit catalogue cuts for all lamps, power supplies, LED drivers, ballasts and emergency battery backup power supplies and ballasts.

D. Data: Submit independent laboratory photometric data in the directed number of copies and in format as directed. Photometric data shall be submitted for standard, "off-the-shelf" units at the time the manufacturer's cuts are submitted. Photometric testing and reporting shall conform to IESNA procedures. Submit additional photometric testing as required by Luminaire Schedule or upon request.

E. Manufacturer's Catalogue Sheets shall indicate input watts and electrical characteristics, ambient temperature rating, noise level rating, mounting methods and UL or ETL listing for use with required source, power supply, LED driver, transformer, lamp and/or ballast (if any).

1.10 SAMPLES

- A. After shop drawings, data and any other required submissions have been approved, submit samples of each of the following components upon request:

1. Samples demonstrating the finishes of any custom metal, paint color or finish. Sample size to be a minimum of 4in (100mm) square. Place labels on the back side of finish samples only.
 2. Material samples of any transmitting media, such as plastic, glass, perforated metal and the like. Sample size to be a minimum of 12in (305mm) square, to allow adequate space for label.
 3. Each downlight reflector cone that differs in size or finish.
 4. Any other luminaires or components requested in the luminaire descriptions, schedule, or in the contract documents.
- B. Submit two (2) samples unless otherwise indicated. If luminaire samples are requested, supply a completely operable luminaire as specified in the Luminaire Schedule and/or incorporating responses to shop drawing, with the specified source and a 10ft (3m) cord and plug for standard 120-volt service. For 277-volt luminaires, also supply a completely wired or plug-wired step-up transformer to convert from 120 to 277 volts, with a 120-volt cord and plug. Provide component parts as specifically requested.
- C. Where a sample is submitted or requested, do not fabricate that luminaire type until the sample is approved. Submit and resubmit a sample as required, until samples are approved.
- D. The purpose of the sample is to review manufacturing techniques, detailing, light source, and scale. Minor modifications, if any, shall be considered part of these Specifications and shall be accomplished at no additional cost.
- E. Submit complete and operable sample luminaires for any proposed substitution or value engineering proposal as indicated above. There shall be no expectation that substitution products or samples received after the substitution period will be accepted or reviewed.
- F. Provide samples as called for in the General Requirements. Tag samples with the name of the project, referenced specification, paragraph or drawing number, the luminaire type number and any other identifying data. Ship the samples to two separate addresses as requested. After review, the samples shall be shipped to the project site for use as standards. All transportation charges for samples shall be paid by Contractor. Make luminaires supplied under the Work of this Section identical with approved samples. Do not install any sample luminaires in the project.
- G. If sample submissions are not approved, samples shall be returned to Contractor, at Contractor's expense. Upon receipt of sample disapproval, immediately make a new submission of samples meeting the comments and contract requirements, as called for in the General Requirements.
- 1.11 PRODUCT DELIVERY, STORAGE, AND HANDLING
- A. Luminaires and their component elements shall be delivered to the job site factory-assembled and wired to the greatest extent practical, in strict accordance with the approved shop drawings, samples, certificates and catalogue cuts, and shall be handled in a careful manner to avoid damage.
- B. Exposed finishes shall be protected during fabrication, transport, storage and handling. Delivered materials shall be identical to the approved samples. Materials which become damaged shall be repaired and/or replaced as directed.
- C. Luminaires shall be stored under cover, above the ground, in clean, dry areas, and shall be tagged and/or marked as to type and location.

- D. Delivered luminaires shall include wiring, sockets, power supplies, LED drivers, ballasts, shielding, channels, lenses and other parts and appurtenances necessary for luminaire installation of each luminaire type.

1.12 MOCK-UP

- A. As a part of the Work of this Section, when specifically called for in the Luminaire Schedule, and at no additional cost to project, temporarily install, connect and adjust a reasonable number of luminaires, three (3) unless otherwise stated. Install completely operable luminaires with all sources, power supplies, LED drivers, ballasts, etc., of each type listed in the Luminaire Schedule where a mock-up is specified, to verify the specified catalogue number and requirements. Place the mock-up luminaires where and when directed. Remove and store mock-up luminaires, when approved, as necessary to complete the work, at Contractor's expense.
 - 1. The mock-up installation shall closely conform to the conditions of the actual installation as to height, distance from ceiling, light source type, output and performance, number and type of sources, material, color, and space finishes, etc. Submit a written description of each proposed mock-up with drawings to obtain approval prior to commencement of each mock-up.
 - 2. Where mounting of mockup may negatively impact existing conditions or constructed scope of Work, temporary mounting methods shall be implemented to avoid any damage.
 - 3. The purpose of the mock-up will be to study the general appearance and performance of the intended lighting systems unless otherwise indicated. At that time, certain minimal test variations may be requested as to lamp location, source type, reflector shape, color, etc. Final modifications, if any, shall be considered as part of these Specifications and shall be accomplished with no additional cost to the project.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide materials, equipment, appurtenances and workmanship for the Work of this Section conforming to the highest commercial standards, as specified and indicated on the drawings. Make luminaire parts and components not specifically identified or indicated on the drawings, of materials most appropriate to their use or function, and resistant to corrosion and to thermal and mechanical stresses encountered in the normal application and function of the luminaires.
- B. Provide recessed luminaires that are constructed to be suitable for and compatible with the ceiling, wall, pavement or other materials and construction in which they will be installed.
- C. Named manufacturers, when listed in the luminaire schedule, are representative of an adequate level of quality and reputation, and are allowed to submit a product, provided that they are capable of satisfying the provisions of the specifications in every respect. This does not mean that any standard product provided by that manufacturer is automatically qualified. Manufacturers not on this list may be proposed during the substitution period if they can substantiate that their product meets every particular of the relevant specification, and are of comparable quality, experience and reputation. See the paragraph titled "Substitutions", above. Any submitted product may be rejected without explanation.

2.2 DEFINITIONS:

- A. CCT: Correlated Color Temperature
- B. CRI: Color Rendering Index
- C. Fixture: See "Luminaire"
- D. IP: International Protection or Ingress Protection Rating
- E. LED: Light Emitting Diode
- F. Lumen: Measured output of source and luminaire or both
- G. Luminaire: Complete lighting unit, including source, gear, reflector and housing

2.3 MARKING OF LUMINAIRES

- A. Luminaires shall be equipped with markings showing safety specifications, construction safeguards, and minimum resistance to hazard sources operation under fault conditions. Marking shall include manufacturer/distributor's name, related voltage or voltage range, rated wattage, light output, optical distribution and rated frequency. LED luminaires not suitable for dimming control are required to indicate this clearly in installation instructions or package labelling. Mark luminaires with replaceable sources according to proper source type. Provide markings that are clear and that are located to be readily visible to service personnel, but invisible from normal viewing angles when sources are in place.

2.4 MATERIALS AND FABRICATION

- A. Provide luminaires completely factory-assembled and wired and equipped with necessary sockets, power supplies, LED drivers, ballasts, wiring, shielding, reflectors, channels, lenses, integral emergency battery packs (if required) and other parts and appurtenances necessary. Deliver to project site ready for installation and to complete the luminaire installation.
- B. Use only completely concealed hardware, unless otherwise noted. Latching of luminaire door frames shall be unobtrusive. Make luminaire free from light leaks by the inherent design of the luminaire body and frame. Bond gaskets, when used, to the luminaire metal. Weld power supply support studs, socket saddle studs and reflector support studs to luminaire body. Flexible leads shall enter luminaires at sides, unless otherwise noted.
- C. Minimum gauges sheet steel: 22-gauge for recessed LED, unless thicker gauge required by regulating agency; unless otherwise specified.
- D. Construct luminaires with the minimum number of joints. Make unexposed joints by approved method such as welding, brazing, screwing or bolting. Soldered joints are not acceptable.
- E. Provide metallic cast or extruded parts of luminaires that are close grained, sound, and free from imperfections or discoloration. Provide cast or extruded parts that are rigid, true to pattern, and of ample weight and thickness. Provide cast or extruded parts that are properly fitted, filed, ground, and buffed finished surfaces and joints free of imperfections. Make thickness on cast parts not less than 1/8in (3mm).

- F. Provide housings that make electrical components easily accessible and replaceable, without removing the luminaire body from its mounting.
- G. Provide luminaires indicated as "continuous" on drawings or specifications with finished end-to-end or wall-to-wall appearance. Verify run lengths per field conditions prior to ordering. Maximize lighted length to nearest six inches (152mm), with equally spaced unlighted portions at each end, not to exceed 3 inches (76mm) each. Provide continuous louvers and/or lenses into unlighted ends and at corners.
- H. Wiring:
 - 1. Provide luminaire wiring between sources, lampholders and associated operating and starting equipment in compliance with UL 1570 and NEC, UL 8750 for LED's.
 - 2. Make connections of wires to terminals of sources, lampholders and other accessories in a neat and workmanlike manner and which are electrically and mechanically secure, with no loose strands protruding. Provide of the appropriate amount of wires extending to or from the terminals of a source, lampholder or other accessory. These wires shall not be in excess of the number which the accessory is designed to accommodate.
 - 3. Provide wiring channels and wireways free from projections and rough or sharp edges throughout. At points or edges over which conductors shall pass and may be subject to injury or wear, grind to make a smooth contact surface with the conductors. Install insulated bushings at points of entrances and exit of flexible wiring.
- I. All interior luminaires shall be UL/ETL/CSA-US listed, "Damp Location" rated at a minimum, with greater protection (UL/ETL/CSA-US "Damp Location" or "Wet Location") as appropriate or required by code for the application.

2.5 FINISHES

- A. The paint finish/color may affect the heat dissipation from luminaires. Apply luminaire finishes after fabrication in a manner that assures a durable wear-resistant surfacing. Prior to finishing, hot clean the surfaces by accepted chemical means, and treat them with corrosion inhibiting (phosphating) treatment to assure positive paint-adhesion. Give exposed metal surfaces (brass, bronze, aluminum and others) and finished castings except chromium-plated or stainless-steel parts an even coat of high-grade methacrylate lacquer, or transparent epoxy. Anodize exposed aluminum surfaces for corrosion resistance. Make sheet steel luminaire housing, and iron and steel parts which have not received phosphating treatment, or which are to be utilized in exterior applications corrosion resistant by zinc or cadmium plating or hot-dip zinc galvanizing after completion of all forming, welding, or drilling operations.
- B. Electroplate parts operated under temperatures injurious to hot-dipped galvanizing.
- C. Cadmium plate screws, bolts, nuts and other fastening or latching hardware.
- D. Except where otherwise indicated provide luminaires with a final synthetic, high-temperature baked enamel coating of color and finish as specified or directed. Unless otherwise specified, provide white baked enamel "reflective" surfaces, with a minimum reflectance of 86 percent. Unless otherwise specified, provide potentially visible non-reflective surfaces with a matte-black baked enamel finish. Prior to painting give all parts proper etched surface preparation to assure paint adherence and durability.

2.6 COMPONENTS

A. General:

1. Provide identical power supply and gear within each luminaire type. Provide power supplies and gear that are suitable and UL-listed for the electrical characteristics of the supply circuits to which they are to be connected and which are suitable for operating LED or relevant light sources, including future LED replacement lamps.
2. Unless otherwise specified, provide power supplies and control gear of same type and same manufacturer for ease of stocking and replacement.
3. Components shall be configured and installed in luminaire by the luminaire manufacturer.
4. Components shall not contain Polychlorinated biphenyls (PCBs) and shall be labeled "No PCBs".
5. Gear housing shall be constructed of painted metal with no sharp edges.
6. Provide only luminaires whose design, fabrication and assembly prevent overheating or cycling of light engines or power supplies under any condition of use.
7. Electronic ballasts shall meet the requirements of the Federal Communications Commission Rules and Regulations, Part 18, Part C (RF Lighting Devices) Non-consumer equipment, regarding radio frequency interference (RFI) (radiated) and electromagnetic interference (EMI) (power line conducted).
8. Submit gear details with luminaire shop drawings.

2.7 TRANSFORMERS FOR LOW-VOLTAGE LUMINAIRES

A. General:

1. Each transformer controlled by a dimmer shall have a suitable choke to eliminate noise during dimming.
2. Secondary wiring shall meet all requirements of this Division and of all applicable local codes. Additionally, secondary wiring shall be sized so that the total average voltage drop on the transformer secondary side does not exceed 3 percent.
3. Source operating voltage, as measured at the socket, shall be between 11.5-12.1 volt for nominal 12-volt sources, and between 23.0-24.2 volt for nominal 24-volt sources. Contractor shall demonstrate that voltage is within this range if requested.

B. Where a remote transformer is required for interior installations, provide a UL listed remote low voltage power supply which meets or exceeds the following requirements, in addition to those of Paragraph A above.

1. Power supply shall contain a toroidal transformer, primary circuit breaker, and thermal protection.
2. Power supply shall be UL listed, suitable for surface or recessed mounting in both walls and ceilings and require zero clearance to combustible materials.

2.8 SOURCES

A. General:

1. Provide electric sources as required, during construction, including sources for luminaires provided by others.
2. Provide a complete set of new lamps, excluding LED lamps and LED light engines. Spare sources are not required for LED luminaires; LED systems shall rely on manufacturer warranty and replaceable drivers where applicable.

3. Submit catalogue cuts of all sources to be used in the Work, along with the shop drawing submittal.
- B. Solid State Lighting / Light Emitting Diode (LED) Light Sources and Luminaires:
1. General:
 - a. Luminaire manufacturer shall have a minimum of five (5) years' experience in the manufacture and design of LED products and systems and no less than one hundred (100) North American installations.
 - b. Unless otherwise specified, luminaire fabrication shall integrate all LED light sources and power/data supplies fabricated by a single manufacturer to ensure compatibility.
 - c. All components peripheral devices, integrated photosensors, occupancy/vacancy sensors, controllers, even if manufactured or provided by others, shall be the responsibility of a single entity, the luminaire manufacturer. All components shall perform successfully as a complete system. Integrated controls shall be programmed onsite to operate as described in Lighting Control Intent Narrative documents or Appendix - Luminaire Schedule.
 - d. Provide submittals as described in Part 1 above.
 - e. Provide two (2) samples of each separate manufacturer and type of LED luminaire if requested in Appendix - Luminaire Schedule. Follow procedure for submitting samples as described in Part 1 above.
 - f. Include all components necessary for a complete installation. Provide all power supplies, synchronizers, data cables, and data terminators for a complete working system.
 - g. All white light LED sources within the same luminaire type shall be within two (2) MacAdam ellipses/steps of each other.
 - h. All LED sources used in the LED luminaire shall be of proven quality from established and reputable LED manufacturers and shall have been fabricated within 12 months before installation per the date code on the module. Acceptable LED component or module manufacturers unless otherwise noted are:
 - 1) Cree, Inc.
 - 2) Lumileds
 - 3) Nichia Corporation
 - 4) Norlux
 - 5) Lextar
 - 6) Osram Optronic Semiconductors
 - 7) Xicato
 - 8) Bridgelux
 - 9) Epistar
 - 10) San'an
 - 11) Citizen Electronics
 - 12) General Electric Company
 - 13) Sora
 - 14) Samsung
 - 15) Seoul Semiconductor
 - 16) Lumenetix
 - 17) Ledengin
 2. Replacement and Spares:
 - a. Manufacturer shall provide written guarantee of the following:
 - 1) Manufacturer's LED system or equivalent system will be available for ten (10) years: Manufacturer will provide exact replacement parts, complete replacement luminaires, or provide upgraded parts that are designed to fit into the original luminaire and provide equivalent distribution and lumen output to the original, without any negative consequences.

- 2) Manufacturer will keep record of original chromaticity coordinates for each LED module and have replacement modules or luminaires from within two (2) MacAdam Ellipses/ steps of the same coordinates available.
 - 3) Manufacturer will keep an inventory or ability to supply replacement parts or complete fixtures within two (2) weeks for component parts or the standard lead time of the original fixture for a complete fixture for duration of warranty period.
 - b. All parts of system shall be replaceable in the field as specified in Appendix - Luminaire Schedule.
 - c. System shall carry a full warranty for a minimum of three (3) years from the date of shipment (or longer if required by the project, also refer to Division 1 – General Requirements for further warranty requirements). Manufacturer shall be responsible for a cost of labor and shipping as agreed between parties, to replace any component of the system that fails within the warranty period.
3. Products and Components – Performance
 - a. LED luminaires and components shall be approved by an NRTL facility such as UL, ETL or CSA/US.
 - b. For applicable fixtures: all products included in system shall use Mil-Std 810F, Random Vibration 7.698g as a minimum standard. In installations subject to vibration, luminaire shall be installed with vibration isolation hardware to sufficiently dampen vibrations.
 - c. All LED components shall be mercury and lead-free.
 - d. All manufacturing processes and electronic materials shall conform to the requirements of the European Union's Restriction on the Use of Hazardous Substances in Electrical and Electronics Equipment (RoHS) Directive, 2002/95/EC.
 - e. LEDs shall comply with ANSI/NEMA/ANSI C78.377-2008 – Specifications for the Chromaticity of Solid-State Lighting Products. Color shall remain stable throughout the life of the source. The chromaticity of the installed product shall match IES LM-80 data showing that the LED's do not shift more than .005 DuV from an approved sample or submitted documentation.
 - f. LEDs testing shall be performed in accordance with IES LM-80 - Approved Method for Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays and Modules.
 - g. LEDs shall have a minimum rated source life of 50,000 hours or as specified in Appendix: Luminaire Schedule. LED "rated source life" shall be determined per IES TM-21 - Projecting Long Term Lumen Maintenance of LED Light Sources based on LM-80 test data. Calculated lifetimes not exceeding testing hours per TM-21 are not accepted.
 - h. Luminaire assembly shall include a method of dissipating heat to prevent degradation of source life, electronic equipment, or lenses. LED luminaire housing shall be designed to transfer heat from the LED board to the outside environment. Luminaire housing shall have no negative impact on life of components. High power LED luminaires shall be thermally protected using one or more of the following thermal management techniques: metal core board, gap pad, and/or internal monitoring firmware
 - i. Luminaire shall be tested and suitable to operate under a minimum of two (2) case temperatures: 55°C (131°F) and 85°C (185°F) and a relative humidity under 65%.
 - j. Manufacturer shall supply in writing a range of permissible operating temperatures and relative humidity levels in which system will perform optimally. LEDs shall be adequately protected from moisture or dust in interior applications.
 - k. All hardwired power connections to LED luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed, shorted or otherwise mis-wired during the installation process.
 - l. For data wiring/cabling, provide CAT5 and CAT6 pinout information.

- m. LEDs shall not be overdriven beyond their specified nominal voltage and current.
 - n. Color-changing luminaires utilizing discrete LED chips shall use an equal combination of each color of LED and shall be capable of a minimum of 8-bit control.
 - o. Manufacturer shall be able to provide supporting documentation of the product meeting third party regulatory compliance.
 - p. Manufacturer shall ensure that products undergo and successfully meet appropriate design and manufacturability testing including Design Failure Mode & Effects Analysis, Process Failure Mode & Effects Analysis, Environmental Engineering Considerations and Laboratory Tests, IEC standards and UL/CE testing.
 - q. Manufacturer shall provide Luminaire Efficacy (lm/W), total luminous flux (lumens), luminous intensity (candelas), chromaticity coordinates, CCT and CRI. optical performance, polar diagrams, and relevant luminance and illuminance photometric data. Provide data in IES file format in accordance with testing standards IES LM-79-08 and IES LM-82-12, based on test results from an independent Nationally Recognized Testing Laboratory or National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.
- 4. All color characteristics, CCT, CRI, Color Fidelity, CIE Chromaticity Coordinates shall be consistent across the entire dimming range.
 - 5. Luminaires shall have less than 30% flicker at frequencies of 200Hz or below at 100% and 20% light output and/or meet IEEE standard PAR 1789.
- C. LED Power Supplies/ Drivers:
- 1. LED driver shall have a minimum 50,000 hour published life while operating at maximum case temperature and 65 percent non-condensing relative humidity.
 - 2. Driver shall be Sound Rated A+.
 - 3. Driver shall be > 80% efficient at full load across all input voltages.
 - 4. Driver shall include ability to turn off at low control input rather than holding at a minimum dimming level and shall consume 0.5 Watts or less in standby/off mode. Control deadband at low control input shall be included to allow for voltage variation of incoming signal without causing noticeable variation in luminaire to luminaire output.
 - 5. Drivers shall track evenly across multiple luminaires at all light levels and shall have an input signal to output light level that allows smooth adjustment over the entire dimming range.
 - 6. Control Input:
 - a. 4-Wire (0-10V DC Voltage Controlled) Dimming Drivers
 - 1) Must meet IEC 60929 Annex E for General White Lighting LED drivers.
 - 2) Connect to devices compatible with 0 to 10V Analog Control Protocol, Class 2, capable of sinking 0.6 ma per driver at a low end of 0.3V.
 - 3) Must meet ESTA E1.3 for RGBW LED drivers.
 - b. Digital (DALI Low Voltage Controlled) Dimming Drivers
 - 1) Must meet IEC 62386.
 - c. Digital Multiplex 512 (DMX Low Voltage Controlled) Dimming Drivers
 - 1) Must meet DMX / RDM: USITT DMX512A and ANSI E1.20 (Explore & Address).
 - 2) Must be capable of signal interpolation and smoothing of color and intensity transitions.
- D. Other:
- 1. For other luminaires, provide sources as specified. If specification is not complete, request clarification before ordering equipment.

2.9 REFLECTORS

A. Reflectors:

1. Provide reflectors and reflecting cones or baffles fabricated from aluminum/plastic reflector sheet no less than minimum thickness listed below for each application, Reflector shall be absolutely free of tooling marks including spinning lines, and free of marks or indentation caused by riveting or other assembly techniques. No rivets, springs, or other hardware shall be visible after installation.
 - a. Cones: 0.0500in (1.27mm)
 - b. Wall wash kicker panels in cones: 0.0400in (1.01mm)
 - c. Reflectors (non-structural): 0.0235in (0.59mm)
 - d. Louvers/Baffles: 0.0200in (0.50mm)
2. Provide reflectors and baffles of first-quality polished, buffed and anodized finish, "Alzak" or approved equal, and with specular or semi-specular finish color to be clear, unless specified otherwise. Provide reflector and baffles which produce no apparent brightness nor a source image, nor shall any part of the source be visible from 50° above nadir to 90° above nadir (vertical). That is, the reflector shall have a maximum 50° cutoff angle and a minimum 40° shielding angle.
3. Provide other aluminum reflectors where required and formed and finished as noted on drawings and elsewhere in the specifications. Provide only reflectors free from blemishes, scratches, or indentations which would distort their reflective function and finished by means of the "Alzak" process, or approved equal, unless otherwise noted. No rivets, springs, or other hardware shall be visible after installation.
4. For luminaires employing multi-color sources or sources emitting more than one distinct frequency of color, provide reflectors, cones, or baffles with low iridescent coating on all surfaces seen from normal viewing angles.
5. Anodized aluminum reflectors shall have the following characteristics:
 - a. Specular:
 - 1) 2 mg/in² (0.31 mg/cm²) minimum Weight of Coating (Anodizing process. Coating of aluminum oxide: Reference ASTM Test Method B-137)
 - 2) 86 minimum Total Hemispherical Reflectance and 70 minimum Specular Component (Reference ASTM Test Method E-903-82 (testing utilizing a TR1 or TR2 Total Reflectometer is also acceptable pending issuance of ASTM standard))
 - 3) 90 minimum Visual Clarity and 0.03 minimum Diffuseness at 15° (c) (Reference ASTM Test Method E-430-78 (1983))

B. Painted Reflectors:

1. Reflectors shall be completely formed before application of primer and enamel color coat or coats.
2. When requested, submit a sufficient quantity of flat steel panels having the identical primer and color coat or coats applied in the same manner as proposed for the contract items.
3. Tests will be required only in case of dispute about reflector characteristics. Tests may be required at any time before or during Contractor's warranty period. Contractor will pay the cost of tests, if required. Reflectors which do not meet the criteria expressed here will be replaced at Contractor's expense, with reflectors meeting specified requirements.
4. Tests:
 - a. Painted reflectors shall have an initial reflection factor not less than 86 percent in the visible range of 400-700 nanometers as per ASTM Method E-424-71 as determined by independent laboratory test of fading, tested in the following manner: One half of sample shall be covered and remaining half shall be exposed to a 150 watt sunlamp placed 1/2in (12.7mm) above reflective surface for 72 hours. Comparison of exposed and unexposed sides shall show no visible fading or deterioration in appearance or reflectance.

- b. The percentage of Specular Gloss shall be a minimum of 80 percent as determined by ASTM Method D-532-T, Procedure A.

2.10 LENSES / FACEPLATES / TRIM

- A. Where plastic lens is indicated, provide lens of 100 percent virgin acrylic (polymethyl methacrylate), nominal 0.125in (3mm) thick, unless otherwise indicated. Lens is to be strain-free, uniform in appearance, and destaticized.
- B. Where clear acrylic lens is indicated, provide lens with a minimum visible light transmittance of 92 percent, unless otherwise indicated.
- C. Where prismatic acrylic lens is indicated, lens shall be composed of 3/16in (4.7mm) square non-convex prismatic cones of maximum 0.080in (2mm) depth and aligned 45° to the length and width of the lens panel, unless otherwise specified. Lens shall be a minimum of 7.5 oz. per square foot (2289g/m²). Lens shall have minimum 80 percent visible light transmittance.
- D. Where diffuse acrylic lens is indicated, lens shall be diffuse frosted white, high transmission acrylic with a minimum 73 percent visible light transmittance unless otherwise indicated. Provide nominal 0.125in (3mm) thick lens unless otherwise specified.
- E. Where acrylic "overlay" is indicated, lens shall be supported by other rigid luminaire members, such as louvers or shelves. Lens shall be white or clear, as specified, with a minimum 79 percent visible light transmission for white lenses, and a minimum 83 percent transmission for clear lenses. Provide 0.040in (1mm) thick lens unless otherwise indicated.
- F. Make lenses, louvers, or other light diffusing elements contained in frames removable, but positively held within the frames so that hinging or other motion of the frame will not cause the diffusing element to drop out.
- G. For recessed luminaires with trim that is removable or open for access to the interior of the luminaire, and serves as a ceiling trim, provide trim that is positively held to the luminaire body by adjustable means that permit the trim to be drawn up to the ceiling as tight as necessary to insure complete contact of faceplate with ceiling surrounding the luminaire.

2.11 RATED LOCATION LUMINAIRES

- A. General:
 - 1. Provide luminaires designed and manufactured specifically for "rated" (e.g., damp, wet, shower, hazardous) location service. Components, including nuts, bolts, rivets, springs, and similar parts shall be made of materials of effective corrosion resistance, or of materials which have been subjected to finishing treatment which will assure such resistance.
 - 2. Provide anodized aluminum for aluminum parts of exterior luminaires that are not specified as requiring a painted finish.
 - 3. All luminaires shall be constructed according to UL procedures, and listed by UL ETL or CSA-US for the appropriate category.
- B. Damp Location:
 - 1. In addition to the requirements of paragraph, above, damp location luminaires shall meet or exceed the following criteria:

- a. Provide metal parts of luminaires, which are specified as requiring painting, for use in indoor, outdoor or damp locations, which are painted with suitable weather and/or moisture resisting qualities.
- b. Provide luminaires for use outdoors, or in areas designated as damp locations, which are suitably and effectively gasketed to prevent access of moisture into electrical components or enclosing diffusers, lenses or globes.
- c. Luminaires shall be UL, ETL or CSA-US listed for damp locations.

C. Wet Location:

1. In addition to the requirements of Paragraphs above, wet location luminaires shall meet or exceed the following criteria:
 - a. Any exposed luminaires shall be UL, ETL or CSA/US rated for wet locations.
 - b. Provide luminaires for use outdoors, or in areas designated as wet locations, which are suitably and effectively gasketed to prevent access of moisture into electrical components or enclosing diffusers, lenses or globes.
 - c. Provide wet location luminaires with a suitable IP rating for their planned environment, unless otherwise specified in Appendix – Luminaire Schedule.
 - 1) Recessed luminaires suitable for wet location shall have a minimum IP54 rating.
 - 2) Surface mounted luminaires exposed to direct rain, shall have a minimum IP65 rating.
 - 3) Luminaires intended to be cleaned by high pressure waterjet cleaning, shall have a minimum IP66 rating.
 - 4) Ground-mounted luminaires located in floodplains, shall have a minimum IP68 rating.

2.12 LUMINAIRE DESCRIPTIONS

A. General:

1. Provide luminaires which conform to the above standards and criteria, as indicated on the drawings, and as indicated below and in APPENDIX - Luminaire Schedule.
2. Verify mounting conditions and trim for all luminaire types.
3. Verify all voltages, and verify which luminaires require ducted or plenum air supply or return capability or are to be static.
4. Catalogue or series numbers, when shown herein, are intended to assist in establishing general type or category of luminaires. Provide a luminaire that meets the complete performance descriptions, as well as information provided by detail drawings. Standard catalogue cuts, when included, are for general assistance. Written luminaire descriptions are the primary basis for luminaire specification. The Luminaire Schedule in the Appendix supersedes any legend or schedule on the Electrical Drawings.
5. The terminology "Or Approved Equal" if and only if used on the Luminaire Schedule, means the following: Products fabricated by alternative manufacturers to those listed may be submitted under the terms of the substitution clauses outlined in this Section. The products must meet the specifications in every way. Any substitutions or alternatives may be accepted or rejected without a detailed explanation.
6. Provide timely and written notification of any discrepancies between drawing and specifications before submitting bids. If such discrepancies are not resolved prior to the end of the bid period, the more costly alternative will be considered as included in the bid price. See paragraph above regarding definition of Acceptable Manufacturers.
7. All finishes are to be factory applied, including colored flanges and trims.

B. Spare Parts / Extra Stock:

1. Provide spare parts and extra stock to the Owner upon completion of the work. Extra stock quantities shall be included in main order to prevent additional cost to the Owner. All boxes shall be clearly labeled regarding contents, relevant luminaire type, and description. All spare parts shall be turned over to the Owner's authorized representative, and a receipt in duplicate, signed by the site representative shall be delivered to the Owner's authorized representative.
 2. The following spare parts shall be provided as a minimum unless otherwise directed by Owner. Additional spare parts shall be provided as required by mention elsewhere in this specification, other sections of these Specifications, or the Contract Drawings:
 - a. Power Supplies/LED Drivers: Five (5) percent (but not less than one (1) of each type)
 - b. Lenses: Ten (10) percent (but not less than one (1) of each type)
 - c. Spare Luminaires for Types L1, L2, and L4: Two (2) of each
- C. LUMINAIRE SCHEDULE: SEE SECTION 26 51 13 APPENDIX LUMINAIRE SCHEDULE AT THE END OF THIS SECTION.
1. Complete specifications for the components (sources, power supplies, LED drivers, ballasts, reflectors, lenses, etc.) of luminaires described below are found above in Part 2. The Luminaire Schedule below supersedes any similar legend or schedule issued previously or issued concurrently on the Drawings. Provide timely and written notification of any discrepancies before preparing any bids or proceeding with any work.
 2. Descriptions for additional luminaire types, specified by the Electrical Engineer, may be located on the Electrical Drawings.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install luminaires complete with light sources, as indicated, and with equipment, materials, parts, attachments, devices, aligner and filler clips, hardware, hangers, cables, supports, channels, frames and brackets necessary to make a safe, complete, and fully operative installation.
- B. Verify and provide luminaires that are appropriate for the ceiling and mounting conditions of the project.
- C. Coordinate with other trades as appropriate to properly interface installation of luminaires with other work.
- D. Reject and do not install blemished, damaged, or unsatisfactory luminaires. Replace imperfect or unsatisfactory luminaires, if installed, as directed.
- E. Set luminaires, when installed, to be true, and free of light leaks, warps, dents, or other irregularities. No light leaks are permitted at the ceiling line or from any visible part or joint of the luminaires. Install luminaires plumb, square, and level with ceiling and walls, in alignment with adjacent luminaires, and secure in accordance with manufacturers' directions and approved shop drawings. Install all adjacent and continuous luminaires straight and trued, aligned in both plan and elevation. Supply and install alignment rods or joint straps as required to achieve this effect.
- F. Provide finish for exposed parts or trims as specified. If not indicated, provide a finish as directed.

- G. Do not install reflector cones, aperture plates, lenses, diffusers, louvers, and decorative elements of luminaires until completion of wet work, plastering, painting and general clean-up in the area of the luminaires.
- H. Mount luminaires at heights and locations indicated on the Contract Drawings, or as required by Architect. Mounting heights specified or indicated are to be to the bottom of each luminaire for suspended and ceiling-mounted luminaires, and to the center of each luminaire for wall-mounted luminaires, unless otherwise noted. Obtain approval of the exact mounting for luminaires on the job before installation is commenced and, where applicable, after coordinating with the type, style, and pattern of the surface being installed.
- I. Conform to the requirements of NFPA 70, and all other relevant codes. Supports shall be suitable for local seismic zone.
- J. In Mechanical Equipment Rooms, luminaires shall be hung from ceilings after piping and equipment therein has been installed. Exact locations for such luminaires shall be determined at the job site during the course of the Work, in coordination with the mechanical work.
- K. Adequately protect the housing of recessed luminaires during installation by internal blocking or framing to prevent distortion of sides, or dislocation of threaded lugs, which, upon completion, shall be in perfect alignment and match the corresponding holes in frames or rims. Holding screws shall be inserted freely without forcing and shall remain easily removable for servicing.
- L. Ground non-current-carrying parts of electrical equipment in accordance with UL and NEC provisions.
- M. Upon completion of installation of luminaires, and after building circuits have been energized, apply electrical energy to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at the site, then re-test to demonstrate compliance. Otherwise, remove and replace with new units, and proceed with re-testing. Coordinate all test times and requirements with the Architect.
 - 1. For normal and emergency building lighting, upon completion of the installation, conduct an operating test to show that the equipment operates in accordance with the requirements of this and other relevant sections.
 - 2. Test all wiring with an insulation testing instrument, both before and after connection of luminaires and equipment. The minimum resistance shall be 250,000 ohms.
- N. Upon completion of the installation, the luminaires and lighting equipment shall be in first class operating order and free from defects in condition and finish. At time of final inspection, all luminaires and equipment shall be clean, fully lamped, and be complete with required lenses or diffusers, reflectors, side panels, louvers, or other components necessary for the function of the luminaires. Any reflectors, lenses, diffusers, side panels or other parts damaged prior to the final inspection shall be replaced prior to inspection.
- O. At the time of substantial completion and prior to field tests, replace lamps (excluding LED lamps and light engines) in interior luminaires which have been operating more than six months, or as work lights, or which are observed to be noticeably dimmed after use and testing during the construction period.
- P. Luminaires and sources that are part of the Work of this section shall not be used for work lights during construction, except in Mechanical Equipment rooms. Provide adequate portable or temporary lighting for construction.

- Q. Vibration Isolation: Mount and support all luminaires in such a manner to isolate the luminaire from structure-borne vibration, including but not limited to vibration caused by fans, motors, moveable tracks, moveable partitions, portable carts, vehicles, etc.

3.2 ACCESSIBILITY

- A. Install equipment such as junction and pull boxes, luminaire housings, transformers, power supplies, ballasts, switches and controls, and other apparatus that shall be reached from time to time for operation and maintenance, to be easily accessible and appropriate for mounting and ceiling conditions.

3.3 SUPPORTS

- A. Luminaires shall be securely fastened as per manufacturer's instructions. Provide plaster frames or mounting frames for luminaires that require them. Such frames shall be appropriate for the ceiling construction in which they are installed.
- B. Provide necessary hardware with luminaires, such as stems, plates, plaster frames, hangers and similar items, for safe support of the luminaire. Provide plaster frames made of non-ferrous metal, or of steel that has been suitably rustproofed after fabrication, as described above.
- C. Provide supports for luminaires that are adequate to support the weight of the luminaires.
- D. Provide hanging devices which, if visible from normal viewing angles, exactly match luminaire finishes specified, unless otherwise noted.
- E. Where necessary to meet fire resistance requirements of Building Code authorities, provide enclosures housing recessed luminaires that are constructed to meet or exceed required fire resistance rating.
- F. Provide attachment devices including brackets and cast metal shapes with the requisite rigidity and strength to maintain continuous alignment of installed luminaires. Attach luminaires to ceiling support members, and do not depend upon lathing, plaster or ceiling tile for alignment or support.
- G. Provide luminaires mounted in suspended ceilings that are supported by saddle hangers or the bars attached to runners or between crossbars of ceiling systems. Provide mounting splines or other positive means of maintaining alignment and rigidity.
- H. Provide supporting members that are surface passivated, and which are primed or paint-dipped to resist corrosion.
- I. Provide fastening devices of a positive locking type, which do not require special tools to apply or remove them. Do not use tie wires in place of fastening devices.
- J. Contractor is responsible for the necessary suspension system. Contractor shall ascertain the structural reliability of supports provided under other Sections of the specification.
- K. Attach reflectors to housings by means of safety chains, which shall prevent reflectors from falling. No part of the chain may be visible after installation, when viewed from any angle up to 50 degrees from the vertical.

- L. Provide pendant or surface mounted luminaires with required mounting devices and accessories, including hickey, stud-extensions, ball aligners, canopies, and stems. Uniformly maintain the luminaire heights shown on the Contract Drawings or established in the field. The allowable tolerances in individual luminaire mounting shall not exceed 1/4 inch (7mm) and may not vary more than 1/2 inch (14mm) from the mounting height shown on the drawings. Install luminaires hung in continuous runs absolutely level, and in line with each other. Hanging devices shall comply with code requirements.
- M. Provide an approved ceiling canopy for each stem, exactly matching specified finishes.
- N. Place stems to be vertical and plumb.
- O. Provide at least two rigid supports for individually mounted suspended linear luminaires. Where luminaires are ganged, provide supports at 8'-0" (2438mm) intervals, unless otherwise indicated.
- P. Recessed and semi-recessed luminaires:
 - 1. Support rods or wires shall be provided with a minimum of four rods or wires per luminaire and located not more than 0'-6" (152mm) from each corner of each luminaire.
 - 2. Do not support luminaires by ceiling acoustical panels.
 - 3. Where luminaires of sizes less than the ceiling grid are indicated to be centered in the acoustical panel, support such luminaires independently or with at least 0'-2 3/4" (19mm) metal channels spanning and wired to the ceiling tees.
 - 4. Provide rods or wires for luminaire support under this section of the specifications.
- Q. Seismic Protection for Lighting Luminaires: Provide luminaires and support to meet all applicable local codes and standards.

3.4 AIMING AND ADJUSTMENT:

- A. Provide labor and tools for final aiming, focusing and adjustment, under the Architect's and Lighting Consultant's supervision, of all adjustable luminaires after regular working hours, and after dark in daylighted areas, whenever necessary, at no additional cost to the project. All luminaires shall be locked into place so that the aiming is not disturbed during future replacement of light source or power supply.
- B. Request preliminary aiming diagrams during the shop drawing submittals. If aiming diagrams are provided, pre-aim those luminaires during installation or prior to final aiming.
- C. If colored or diffusing filters are specified, supply up to four (4) theatrical gels for each luminaire type, in colors to be selected by the Architect after installation. Place alternate gels over the luminaires as requested. When the final colors are selected, order the filters from the manufacturer, and install them. Note that the time between ordering and shipping may be approximately four weeks.
- D. When extra lenses, louvers or shields are specified, change accessories until a final selection is made.
- E. Note final aiming and locked positions and include that information in the O&M manual.

3.5 CLEANING

- A. Immediately prior to occupancy, clean reflector cones, reflectors, aperture plates, lenses, louvers, sources and decorative elements. As per manufacturer's instructions, de-staticize lenses after cleaning, installing them to leave no finger or dirt marks.
- B. Upon completion of the luminaire installation and at the time of final inspection, luminaires shall be clean, and free from marks, dust, spotting or other defects. Replace any broken or defective parts prior to final inspection. Replace or make good all defects revealed by final inspection.
- C. Protect installed luminaires from damage during the remainder of construction period.

3.6 COMMISSIONING

- A. For any luminaire, power supply, LED driver, ballast, or lighting control system, provide a complete and operational system which meets or exceeds the performance specified.
- B. The Owner shall provide for or engage an independent commissioning agent to verify that all components and system as a whole meets design intent and to evaluate the Contractor's work. This includes evaluation and verification of all adjustable features, such as aiming angles, time clock settings, sensitivity settings, high end trim, fine tuning, customized settings, etc. Provide labor and equipment after normal working hours to correct and adjust system, working with or without direct supervision of commissioning agent until reasonable satisfaction has been achieved.
- C. Provide Spares, as described in Part 2 above.
- D. Submit a maintenance manual and operational submittals, as called for in Part 1 above, and under the conditions of the relevant General Requirements. After submittal is reviewed, make changes and resubmit, if necessary. After review and approval, this manual will be kept on site for reference use by facility maintenance personnel.
- E. Assemble and submit in either a bound 8.5in x 11in (216mm x 279mm) format or electronic format, as confirmed by Owner, an Operation and Maintenance Manual that includes the following:
 - 1. A chart clearly documenting the luminaire, source, power supply, LED driver and/or ballast actually installed for each luminaire type, with product designations sufficient for reordering new product and components to match those installed.
 - a. For Digital Addressable Fixtures: A chart clearly documenting luminaire type, Make/Model, location, digital address, control address, for client operation and for future maintenance.
 - 2. A current list of lighting distributors, manufacturers and manufacturer's representatives, (for the purposes of replacement, reordering or trouble-shooting). This list shall be keyed to the list of luminaires, sources, power supplies, LED drivers and ballasts, so that the Owner has a name, address and phone number of at least two (2) contacts for each product or component.
 - 3. Shop drawings, technical data sheets, product technical documents, installation instructions, cut sheets, operating instructions, calibration instructions, and troubleshooting guides in the installation, including but not limited to sources, power supplies, LED drivers, ballasts and lighting control devices.
 - 4. Color-coded as-built drawings showing all source, power supply, LED drivers and ballast types, to facilitate replacement. O&M Walk-through: Transfer of the O&M document will include a thorough walk-through and demonstration of equipment by Contractor for facility personnel.

- F. Owner Training: At the Owner's convenience, provide a minimum of four (4) hours, not to exceed eight (8) hours, of expertise and training concerning the installation, characteristics, operations and maintenance of the Work of this Section. Such training shall take place after the Owner has been provided the final approved maintenance and operational submittals mentioned above.
- G. Video-tape the training session and provide two (2) copies on flash/thumb drives, or DVD. Alternative electronic formats may be provided if mutually agreed upon.
- H. Solid State Lighting / Light Emitting Diode LED luminaires:
 - 1. Color Changing or Programming Support
 - a. Manufacturer or their local representative shall provide installation and commissioning support to the electrical contractor as required to achieve a complete and operational system that meets the intent of the Control Intent Narrative.
 - b. The manufacturer or their local representative shall assist the Contractor and ensure that the color changing system is installed, programmed and operating correctly, that all integral sensors are functioning properly and to verify luminaire performance. Integrator shall coordinate with contractors, other required disciplines and with luminaire manufacturers to ensure that the lighting color-changing and/or control system is coordinated between the various disciplines for a fully functioning system. Commissioning shall include intermittent testing of lighting system and other components during the process of construction, as well as up to two (2) full days of programming sessions with the owner's representatives and lighting designer. This shall be subsequent to the final completion of system start-up. Additional programming days may be added as required.

PART 4 - APPENDICES

4.1 GENERAL

- A. The appendices listed below are integral parts of the specifications and contract documents. If either Appendix is missing or incomplete, provide timely and written notification. Do not submit a bid based on incomplete information.

4.2 APPENDIX A – LUMINAIRE SCHEDULE

- A. See Part 2 above for complete specifications for the components (sources, power supplies, LED drivers, ballasts, reflectors, lenses, etc.) of the luminaires described in the Schedule. The Luminaire Schedule below supersedes any similar legend or schedule issued previously or issued concurrently on the drawings. Provide timely and written notification of any discrepancies before preparing any bids or proceeding with any work.

4.3 APPENDIX B – LUMINAIRE CUTSHEETS

- A. Contractor shall provide luminaires that meet the complete performance descriptions in Part 2 and the Appendix above, along with luminaire detail drawings and sketches. If there are any discrepancies between luminaire descriptions, catalogue numbers, sketches, or catalogue cuts that are unresolved during the bid period, the more costly option will be considered as included in the bid prices. The information in standard catalogue extracts are for general information only,

and the product provided must meet all criteria described in the Luminaire Schedule and in this specification section above.

END OF SECTION 265113

Luminaire Schedule									
<div><div>GENERAL NOTES:</div><div><div><div>- Provide luminaire shop drawings for Lighting Consultant, Architect, and Owner approval prior to fabrication. For all continuous run luminaires, including track, manufacturer shall submit a layout drawing for run lengths specified on architectural drawings during submittal review for Lighting Designer and Architect approval prior to fabrication.</div><div>- Architect shall verify all luminaire body, trim, flange, pole, track and any other visible accessories/hardware finishes. All visible conduit, junction boxes, canopy plates, hardware, gear containers, etc. shall be painted to match adjacent surfaces (Architect to verify).</div><div>- Refer to electrical drawings for voltage information. Electrical contractor shall verify all voltages with Electrical Engineer before placing any orders or proceeding with any work.</div><div>- Electrical contractor shall verify emergency operation of all luminaires with Electrical Engineer before placing any orders or proceeding with any work. Refer to electrical drawings for all emergency or code-related requirements.</div><div>- Contractor shall verify and coordinate recessed luminaire installation and mounting with architectural details, housing type, field conditions, and ceiling system details including grid type and flange requirements such that there are no light leaks between luminaire and ceiling system and luminaire can accommodate ceiling thickness.</div><div>- Contractor to verify and coordinate all other luminaire installation and mounting with architectural details and field conditions.</div><div>- Contractor shall verify mounting details with architect and/or architectural drawings and order all mounting components necessary for installation of luminaire at no additional cost, even if such components are not specifically called for in the contract documents.</div><div>- Provide adequate and sturdy support for each luminaire. Contractor shall be responsible for verifying weight and mounting method of all luminaires and furnish and install suitable supports. Luminaire mounting assemblies shall comply with all local seismic codes and regulations.</div><div>- Provide all luminaires as shown complete with all light sources, completely wired, controlled and securely attached to supports.</div><div>- Where both narrative and/or pictorial luminaire descriptions are provided, the written description shall take precedence and prevail. Contractor to confirm via RFI process with lighting designer and architect.</div><div>- Locations of luminaires are shown diagrammatically. Verify exact location and spacing with architectural drawings and designer at the site during installation. Notify Owner about field conditions at variance with Contract Documents before commencing installation.</div><div>- At the completion of construction, clean lenses and reflectors of all luminaires so as to render them free of any material, substance or film foreign to the luminaire. Blemished, damaged, or unsatisfactory luminaires shall be replaced in a satisfactory manner.</div></div><div><div>- When applicable, contractor shall review existing circuiting, verify new loads and panel capacity. Contractor shall notify Owner if a conflict between design documents and field conditions occur.</div><div>- Contractor shall refer to electrical drawings for information on controls and dimming requirements, and coordinate luminaire and control accessories required for a fully functioning system.</div><div>- Contractor to provide line item pricing at bid phase or earlier as requested by lighting designer or architect per type with labor and installation shown as separate line items.</div><div>- All 0-10V dimming gear provided shall be isolated to avoid AC interference on the dimming line.</div><div>- All LED sources within the same luminaire Type shall be within two (2) MacAdam ellipses/steps of each other.</div><div>- For all adjustable luminaires provide labor and materials for final aiming and locking of all adjustable luminaires under the Architect's supervision. Aiming shall take place immediately before building is turned over to Owner, after regular working hours where required. Contractor shall coordinate necessary personnel and equipment</div><div>- All luminaires shall have a minimum 3-year warranty.</div><div>- All lighting systems shall be ordered with necessary gear, power feeds and mounting accessories as required for installation of a complete system.</div><div>- Locate remote gear in a secure, concealed, accessible and well-ventilated location in compliance with manufacturer's directions.</div><div>- All luminaires and workmanship shall be guaranteed free of defects and fully operational for a minimum of one year after the acceptance of the project by the Owner unless otherwise indicated in the specifications. Any luminaires or workmanship found to be defective during the warranty period shall either be fixed or replaced by the Contractor at no cost to the Owner.</div><div>- The luminaires and workmanship must be in accordance with and meet the standards and regulations of the following: Underwriters Laboratories, National Electric Code, & Local Building and Life Safety Code Agencies.</div><div>- Replace all burned-out or inoperative sources and gear in all luminaires before the building is accepted by the Owner so that all luminaires will be in first class operating condition.</div><div>- For pendant mounted luminaires provide adequate cord length to suspend luminaires at heights shown on architectural drawings or indicated in the lighting fixture schedule.</div><div>- Electrical contractor shall field-verify each run length of continuous fixtures prior to ordering.</div><div>- Provide luminaire samples per type as requested in the Fixture Schedule. Supply a completely operable luminaire with cord and plug for standard 120 Volt service.</div><div>- Code required accessories and controls such as but not limited to motion sensors, photocell controls, dimming controls, etc. to be specified and coordinated by Electrical Engineer.</div><div>- Contractor shall follow all manufacturer installation instructions and inform the Architect if there is a conflict with design documents.</div></div></div></div>									
TYPE	LOCATION	DESCRIPTION	LAMPS/SOURCE	POWER SUPPLY/ DRIVER	INPUT WATTS	INPUT WATT UNITS	LISTING	MANUFACTURER	NOTES
L1	South lower wall	5 13/16" Aperture recessed round trimmed LED wall washer Dimensions: Fixture: 5 13/16" Diameter Housing: 18 1/16"Length x 5 1/4" Width x 6 5/16" Height	LED 3000K 80CRI L70 @ 50,000 Hours 2526 Lumens	Integral DIM	36.0W	EA	UL listed for damp locations	USAI BEVELED 2.2 RETROFIT 4.5" WALL WASH B4RWRT-36E1-30KS-W1-D1-(BEVEL FINISH)-(FLANGE FINISH)-RT-UNV-(DIMMING)	1. Contractor shall verify and coordinate luminaire installation and mounting with architectural details, housing type, field conditions, and ceiling system details including ceiling thickness, grid type, flange and insulation clearance requirements. 2. Electrical Engineer/Contractor to verify compatibility of light source, gear, controls, and dimming with the existing system. 3. Luminaire finish to be verified by architect.
L2	South and north upper wall	6" Aperture suspended round LED cylinder wall washer Dimensions: 6" Diameter x 10" Height	LED 3000K 80CRI L70 @ 50,000 Hours 2000 Lumens	Integral DIM	33.0W	EA	UL listed for damp locations	USAI BEVELED 2.2 CYLINDER WALL WASH CBRW10-33C3-30KS-W2-D2-(FINISH)-(MOUNTING)-UNV-(DIMMING)	1. Bottom of luminaire shall be suspended in alignment with the painted wall finish line. Refer to architectural drawings for suspension height AFF, provide suspension length or sufficient length of field-adjustable suspension as required. 2. Electrical Engineer/Contractor to verify compatibility of light source, gear, controls, and dimming with the existing system. 3. Luminaire finish to be verified by Architect.
L3	Portal	3.25" Wide surface-mounted linear LED light Dimensions: 3.25" Width x 1.76" Height x Length per plan	LED 3000K 80CRI L70 @ 60,000 Hours 814 Lumens	Remote DIM	6.6W	FT	UL listed for damp locations	VODE NEXA 807 807-NX3-SL-(RAIL LENGTH)-SC-(REMOTE POWER)-(POWER TYPE)-2-0-Z-SO-30-CD-0-(FINISH)-(OPTIONS)	1. Bottom of luminaire shall be in alignment with bottom of the wood slats. 2. Modular units to be installed for a continuous run condition as shown on drawing. 3. Electrical Engineer/Contractor to verify compatibility of light source, gear, controls, and dimming with the existing system. 4. Locate remote gear in a secure, concealed, accessible and well-ventilated location in compliance with manufacturer's directions. Contractor/Manufacturer to coordinate remote gear size, location and wire gauge for <2% Voltage drop over entire length of run. 5. All wiring shall be plenum-rated. 6. Luminaire finish to be verified by architect.

TYPE	LOCATION	DESCRIPTION	LAMPS/SOURCE	POWER SUPPLY/ DRIVER	INPUT WATTS	INPUT WATT UNITS	LISTING	MANUFACTURER	NOTES
L4	East wall	2.25" Wide surface-mounted RGBW linear LED color changing grazer in architectural channel Dimensions: 2.25" Width x 3.06" Height x Length per plan	LED RGB30 L70 @ 50,000 Hours 1680 Lumens	Integral DMX	9.0W	FT	ETL listed for damp locations	INSIGHT LIGHTING RGBW STRUCTURE GRAZE MI-MO-RGB30-Q-1060-FM-(LENGTH PER PLAN)-DMXFX-(FIXTURE FINISH)-(CANOPY FINISH)-CR-SA27411-SA27636 -MOD(BLK LEADER CABLE) + LIGHTDIAL CONTROLLER-LD	1. Contractor shall coordinate mounting and luminaire lengths with architetcural channel details. 2. Modular units to be installed for a continuous run condition as shown on drawing. Refer to architectural drawings for length of continuous runs, contractor shall provide an optimal combination of luminaire lengths to provide a continuous run as shown on architectural drawings. 3. Electrical Engineer/Contractor to verify compatibility of light source, gear, controls, and dimming with the existing system. 4. Luminaires shall be controlled by a DMX lighting controller server with manual control of color, as well as pre-set dynamic color-changing shows loaded onto the controller from a free show software. Supply, install and commission a complete working system that will provide DMX-controlled color-changing light for the (describe lighting/Types) as a complete system capable of unified color changes/dynamic programmed effects. The controls for this feature shall control the color-changing luminaires indicated on drawings. The system shall include all luminaires, control wire and control equipment as required to provide a functioning system. 5. Luminaire finish to be verified by architect.
L5	East wall	2" Wide wall-mounted linear LED downlight installed on vertical face of the architectural channel Dimensions: 2" Width x 4 3/8" Height x Length per plan	LED 3000K 80CRI L70 @ 200,000 Hours 675 Lumens	Integral DIM	5.6W	FT	ETL listed for damp locations	PRUDENTIAL BIONIC PRO2 LINEAR BPRO2-LIN-FLSH-LED3-MO-(LENGTH PER PLAN)-(COLOR/LAMINATE)-(CANOPY COLOR)-MGZ-NU-SC-UNV-WMC-WALL-(DIMMING)-FTR	1. Refer to architectural drawings for mounting height AFF. 2. Contractor shall coordinate mounting and luminaire lengths with architetcural channel details. 3. Modular units to be installed for a continuous run condition as shown on drawing. Refer to architectural drawings for length of continuous runs, contractor shall provide an optimal combination of luminaire lengths to provide a continuous run as shown on architectural drawings. 4. Electrical Engineer/Contractor to verify compatibility of light source, gear, controls, and dimming with the existing system. 5. Luminaire finish to be verified by architect.
L6	Portal	2.25" Wide wall-mounted linear LED downlight mounted to architectural rail Dimensions: 2.25" Width x 2.75" Height x Length per plan	LED 3000K 80CRI L70 @ 50,000 Hours 1354 Lumens	Integral DIM	9.0W	FT	ETL listed for damp locations	INSIGHT LIGHTING STRUCTURE GRAZE MI-MO-3000K-1060-EAB-X-(LENGTH PER PLAN)-(VOLTAGE)-(DIMMING)-(FIXTURE FINISH)-CR-ILV-MOD(BLK LEADER CABLE)	1. Bottom of luminaire shall be in alignment with top of the laminate portal wall. Refer to architectural drawings for mounting height AFF. 2. Modular units to be installed for a continuous run condition as shown on drawing. Refer to architectural drawings for length of continuous runs, contractor shall provide an optimal combination of luminaire lengths to provide a continuous run as shown on architectural drawings. 3. Electrical Engineer/Contractor to verify compatibility of light source, gear, controls, and dimming with the existing system. 4. Luminaire finish to be verified by architect.

Meydenbauer Center: Center Hall Remodel

CONSTRUCTION DOCUMENTS

22 December 2025



Meydenbauer Center: Center Hall Remodel

250028

CONSTRUCTION DOCUMENTS

22 December 2025

BeveLED® 2.2 Retrofit
4.5" Round Wall Wash - B4RWRT



B4RWRT



usailighting.com/beveLEDRT

Introducing BeveLED 2.2, the newest generation of our iconic BeveLED 2.1 family. BeveLED is most complete recessed LED downlight product family available, and the best solution for any project. Now available with industry-leading performance and features that includes:

FEATURES

- Install-from-below in existing ceilings with retrofit housing
- Dry/damp/wet location rated for bathrooms and showers
- 1% dimming standard + more dimming options
- Clear overspray protector for installation convenience
- Full family platform
- Iconic beveled look

WALL WASH PERFORMANCE DATA

See Page 3

LED COLOR CHOICES

	Classic White						Warm Glow Dimming	
	9W	12W	16W	24W	33W	36W	16W	32W
Source Lumens:	1150	1300	1725	2400	3025	4150	1275	2150

*Based on 3000K, 80+ CRI. Performance varies for each specific beamspread and color temperature. See IES files for exact values at usailighting.com.

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HOW TO SPECIFY

BeveLED® 2.2 Retrofit
4.5" Round Wall Wash - B4RWRT



Specify fixture part number. (All boxes must be filled in to correctly order)

B4RWRT							RT					
Fixture	Wattage Options	LED Color Options	Beam Options	Wall Wash Lens	Bevel Trim Finish Options	Flange Finish Options	Housing Options	Voltage Options <i>Select one</i>	Dimming Driver Options			
B4RWRT BeveLED 4.5" Round Wall Wash Retrofit	Classic White				WH White	WH White	RT Retrofit Install- From-Below Housing	UNV 120V-277V	For use with Universal Voltage 120V - 277V No Additional Charge D6E EldoLED 0-10V, 1% (provided standard) D6F EldoLED 0-10V, 1% D4C Lutron Ecosystem, 1% (5) D4H Lutron H ECO, 1% Fade (2, 3) D6A EldoLED 0-10V, 0.1% D6B EldoLED 0-10V, 0.1% D7A EldoLED DALI2, 0.1% D7B EldoLED DALI2, 0.1% D7E EldoLED DALI2, 1% D7F EldoLED DALI2, 1% D28 EldoLED DMX, 0.1%			
	09C3 9W LED	27KS 2700K, 80+ CRI	W1 Tilted Wall Wash Optic	D1 Diffusion Glass	SC Conduit Silver	SC Conduit Silver						
	12C3 12W LED	27KH 2700K, 90+ CRI			GR Grey	GR Grey						
	16C3 16W LED	30KS 3000K, 80+ CRI			BL Black	BL Black						
	24C3 24W LED	30KH 3000K, 90+ CRI			BZ Bronze	BZ Bronze						
	33C3 33W LED	35KS 3500K, 80+ CRI			PR Primer Finish	PR Primer Finish						
	36E1 36W LED	35KH 3500K, 90+ CRI	W2 Horizontal Wall Wash Optic (1)	D2 Diffusion- Glass	AC Clear Matte Anodized	WH White						
	Warm Glow Dimming	16WG2 16W LED 32WG2 32W LED			2722KS 2700K-2200K, 80+ CRI 2722KH 2700K-2200K, 90+ CRI 3022KS 3000K-2200K, 80+ CRI 3022KH 3000K-2200K, 90+ CRI	W1 Tilted Wall Wash Optic				D3 Diffusion Glass	SC Conduit Silver	BL Black
											BZ Bronze	BL Black
											BZ Bronze	BZ Bronze
AB Piano Gloss Black							WH White					
GR Grey			GR Grey									
					BL Black	BL Black						
					BZ Bronze	BZ Bronze						
					RAL Custom Color Specify RAL #	RAL Custom Color Specify RAL #						

1 Not available with 36E1LED
2 Not available with Warm Glow
3 Not available with 9W
4 Not available with 33W
5 Not available with Classic White. For use with Warm Glow only

TRIM FINISH OPTIONS



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CONSTRUCTION DOCUMENTS
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Type:
L1

BeveLED® 2.2 Retrofit

4.5" Round Wall Wash - B4RWRT



DELIVERED PERFORMANCE

We offer an extremely wide range of wattages, color temperatures, LED color technologies, and beamspreads for this product line. Please refer to tables below and IES files available at usailighting.com for exact performance values for the product configuration you choose to specify. All values are reported at 3000K, 80+ CRI, with solite glass lens and white trim finish. Use multipliers below to calculate output with other color temperatures, CRIs, finishes and lenses.

Color Technology	LED	Lumens	lm/W	Intensity (cd)
Classic White	09C3	757	84	423
	12C3	861	72	481
	16C3	1150	72	642
	24C3	1595	66	890
	33C3	2003	59	1119
	36E1	2526	75	1250
Warm Glow Dimming	16WG2	659	41	274
	32WG2	1111	38	463

TRIM FINISH MULTIPLIER

Metalized Grey,
Conduit Silver,
Clear Matte
Anodized Bevels: 1.00

Black,
Statuary Bronze
Piano Gloss
Black Bevels: 0.846

CORRELATED COLOR TEMPERATURE MULTIPLIER

	Classic White								Warm Glow Dimming			
	2700K		3000K		3500K		4000K		2700K		3000K	
Color Rendering Index:	80+	90+	80+	90+	80+	90+	80+	90+	80+	90+	80+	90+
Multiplier for Lumen Output:	0.94	0.78	1.00	0.78	1.00	1.00	1.06	1.06	0.94	0.74	1.00	0.80

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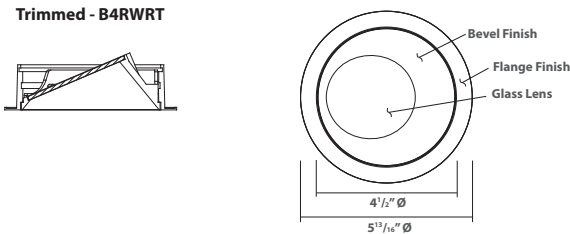
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BeveLED® 2.2 Retrofit
4.5" Round Wall Wash - B4RWRT



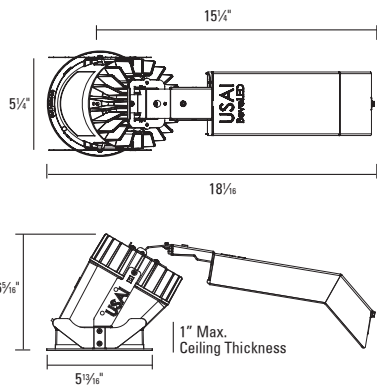
TRIM DETAILS

Trimmed - B4RWRT

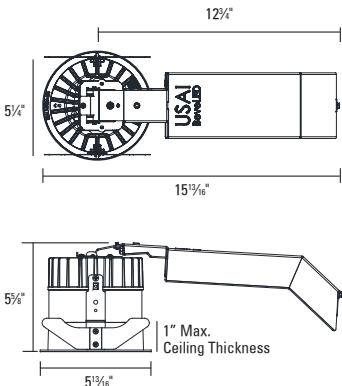


HOUSING OPTIONS

Retrofit Housing - RT
for W1 Optic



Retrofit Housing - RT
for W2 Optic



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BeveLED® 2.2 Retrofit 4.5" Round Wall Wash - B4RWRT



FIELD REPLACEABLE LED LIGHT ENGINE

is serviceable through the aperture without tools or with a Phillips screwdriver. All USAI Lighting light engines feature industry-leading color consistency.

Classic White Light

Our proprietary LED light engines achieve a 2-step MacAdam ellipse along the black body locus, resulting in reliable and uniform color from fixture to fixture. You'll see the results in consistently beautiful light throughout your space, whichever USAI LED product you specify.

Warm Glow® Dimming

Warm Glow Dimming provides warmth and glow once possible only in dimmed incandescent sources. Utilizing our patented proprietary algorithm and circuitry, Warm Glow Dimming technologies precisely mimic the black body curve of a standard 100W A19 lamp by gradually transitioning from 2700K or 3000K down to 2200K. The result is virtually indistinguishable from an incandescent light source.



FIELD REPLACEABLE DRIVER

Unless otherwise specified, a 0-10V, 100%-1% solid state electronic constant current integral D6E dimming driver with a high power factor is provided standard and sources 2mA. All integral dimming drivers are located within the fixture housing and are serviceable from below the ceiling through the aperture. Some on-time delay may be experienced depending on control system used. D6 and D15 dimming drivers source 2mA. All dimming drivers comply with IEEE C62.41 surge protection.

HOUSING

Flanged die cast aluminum mounting collar is attached to die cast aluminum heatsink with 20 gauge black powder-coated steel sleeve. 16 gauge galvanized steel junction box contains driver and has (2) 7/8" knock outs.

MOUNTING

Installs from below. Fixture is held in place with (2) leaf springs attached to flanged die cast aluminum mounting collar, powder-coated with trim finish specified.

FIXTURE WEIGHT

8 lbs.

WARRANTY

Based on IESNA LM80-2008, BeveLED has a 50,000 hour rated life at 70% lumen maintenance (L70). USAI Lighting Warranty covers replacement parts for 5 years from date of shipment. Ambient temperatures at fixture location should not exceed 40°C during normal operation.

CEILING CUT OUT

5-1/2" Ø

LISTINGS

Dry/Damp/Wet location under covered ceilings only. AB and AC trim finishes are dry/damp rated only. UL2043 rated for use in air handling plenums. NRTL/CSA-US tested to UL standards. IBEW union made. All USAI Lighting products are Buy American Act (BAA) compliant. Declare Red-List Approved.



NOTES

- Not for use in corrosive environment
- Use of pressure washer voids warranty

PHOTOMETRICS

Consult factory or website for IES files. Tested in accordance with IESNA LM79.

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BeveLED[®] 2.2 Cylinder Wall Wash — CBRW10



usailighting.com/cylinders

Power and beauty are both in play with our sleek architectural cylinders. The BeveLED Cylinder provides industry-leading performance for any ceiling type, with more lumen packages and dimming options than ever before. The full family platform includes a variety of downlight and wallwash distributions, USAI's patented color technologies, and pendant and surface-mount solutions.

FEATURES

- Powerful performance in a full range of lumen packages and beamspreads in a variety of standard or custom colors
- Surface mount design conceals mounting hardware and provides seamless finish to ceiling plane.
- Rigid pendant stem with 30° hang straight feature
- Convenient conduit cutout canopy mounting option for attachment to surface-mounted junction boxes and conduit
- Remote driver options and emergency battery packs for ease of service

BEVELED WALL WASH CYLINDER PERFORMANCE DATA

See Page 5 for details

Classic White

Wattage:	9W	12W	16W	24W	33W
Source Lumens:	1150	1300	1725	2400	3025
Delivered Lumens:	750	850	1150	1600	2000

*based on 3000K, 80+ CRI

Page 1

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Meydenbauer Center: Center Hall Remodel

250028

CONSTRUCTION DOCUMENTS

22 December 2025

Type:

L2

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BeveLED[®] 2.2 Cylinder Wall Wash — CBRW10 with Integral Driver

Specify fixture part number. All boxes must be filled in to correctly order.

INTEGRAL DRIVER ORDERING INFORMATION

CBRW10			W2	D2				
BeveLED Cylinder	Wattage Options	LED Color Temperature Options	Beam Options	Lens Options	Finish Options	Mounting Options	Voltage Options	Dimming Driver Options
Classic White Light CBRW10 BeveLED Wash Wash Cylinder 10" Length	09C3 9W LED 12C3 12W LED 16C3 16W LED 24C3 24W LED 33C3 33W LED	27KS 2700K, 80+ CRI 27KH 2700K, 90+ CRI 30KS 3000K, 80+ CRI 30KH 3000K, 90+ CRI 35KS 3500K, 80+ CRI 35KH 3500K, 90+ CRI 40KS 4000K, 80+ CRI 40KH 4000K, 90+ CRI	W2 Horizontal Wall Wash Optic	D2 Diffusion Glass	WH White SC Conduit Silver GR Grey BL Black BZ Bronze RAL Custom Color	SM Surface Mount to recessed junction box CC Conduit Cutout for surface mounted 4" octagonal junction box Rigid Stem Mount + Recessed JBox Canopy Style PR1B 2' Nominal, Field Cuttable PR2B 4' Nominal, Field Cuttable PR3B 8' Nominal, Field Cuttable Rigid Stem Mount + Conduit Cutout Canopy Style PJ1B 2' Nominal, Field Cuttable PJ2B 4' Nominal, Field Cuttable PJ3B 8' Nominal, Field Cuttable	UNV 120V - 277V 120V	For use with Universal Voltage 120V or 277V D6E EldoLED 0-10V, 1% (provided standard) D6F EldoLED 0-10V, 1% D6A EldoLED 0-10V, 0.1% D6B EldoLED 0-10V, 0.1% D4H Lutron H ECO, 1% Fade (2) D7A EldoLED DALI2 (DT6), 0.1% D7B EldoLED DALI2 (DT6), 0.1% D7E EldoLED DALI2 (DT6), 1% D7F EldoLED DALI2 (DT6), 1% D28 EldoLED DMX, 0.1% (3) For use with 120V only D19 Phase dimming 1%, 120V only (1, 2)
1 Not available for 33W 2 Not available for 9W 3 Not available with rigid stem for lengths over 2'								

TRIM FINISH OPTIONS



White (WH) Conduit Silver (SC) Grey (GR) Black (BL) Bronze (BZ)
 Custom colors also available

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Type:


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BeveLED[®] 2.2 Cylinder Wall Wash — CBRW10

DELIVERED PERFORMANCE

We offer an extremely wide range of wattages, color temperatures, LED color technologies, and beamspreads for this product line. Please refer to tables below and IES files available at usailighting.com for exact performance values for the product configuration you choose to specify. All values are reported at 3000K, 80+ CRI, with white trim finish. Use multipliers below to calculate output with other color temperatures, CRI, finishes and lenses.

Color Technology	LED	Lumens	lm/W	Intensity (cd)	Emergency Battery Light Output Multiplier	
					EM5	EM7C
 Classic White	09C3	757	84	423	0.7	0.95
	12C3	861	72	481	0.5	0.666
	16C3	1150	72	642	0.385	0.476
	24C3	1595	66	890	0.275	0.317
	33C3	2003	59	1119	0.170	0.222

FINISH LIGHT OUTPUT MULTIPLIER

Grey,
Conduit Silver: 1.00

Black,
Bronze: 0.846

CORRELATED COLOR TEMPERATURE MULTIPLIER

 Classic White

	2700K		3000K		3500K		4000K	
Color Rendering Index:	80+	90+	80+	90+	80+	90+	80+	90+
Multiplier for Lumen Output:	0.94	0.78	1.00	0.78	1.00	1.00	1.06	1.06



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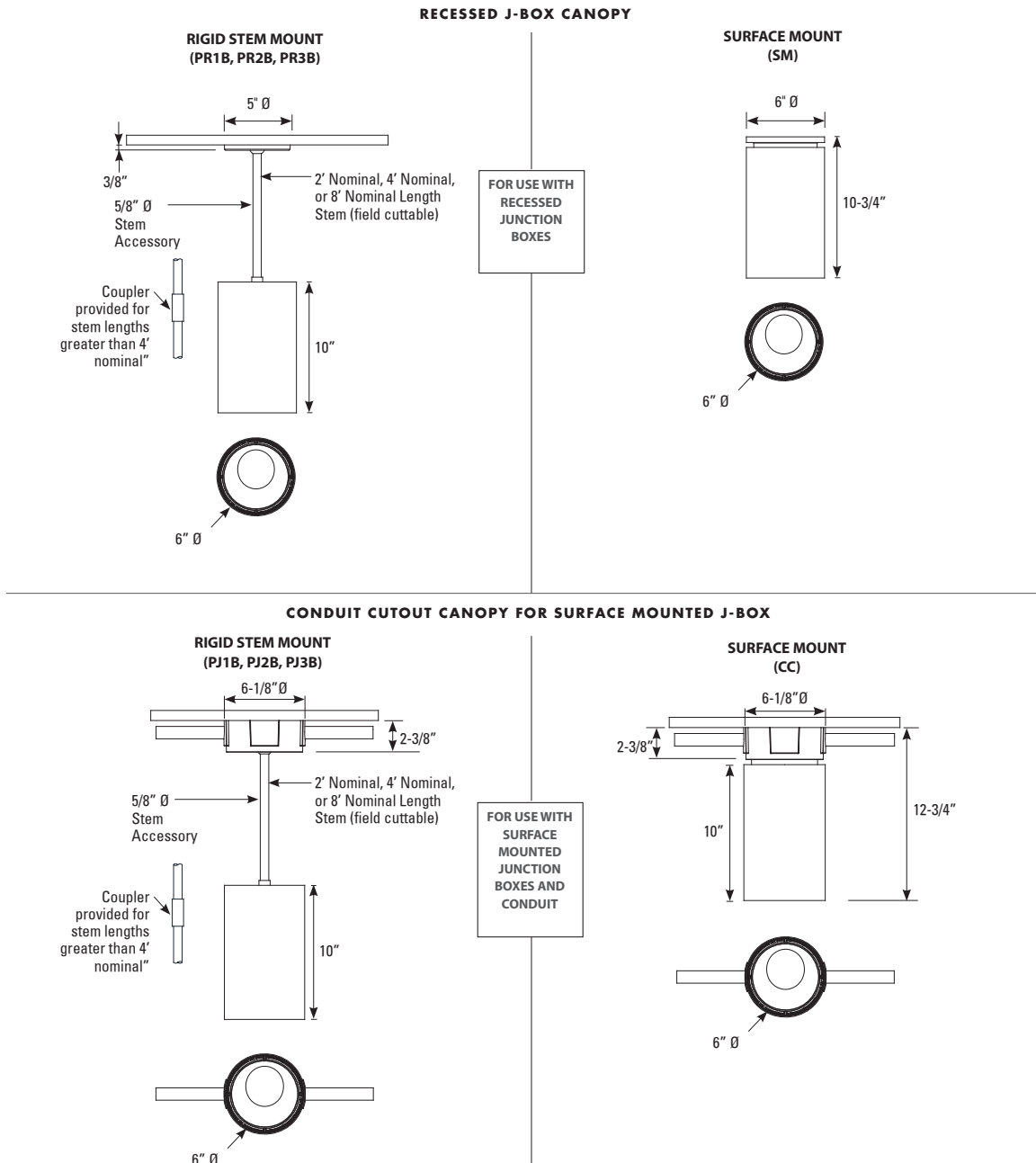
Type:

L2

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BeveLED® 2.2 Cylinder Wall Wash — CBRW10

DIMENSIONS



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Type:
L2

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BeveLED[®] 2.2 Cylinder Wall Wash — CBRW10

BEVELED 2.2 CYLINDER SPECIFICATIONS

FIELD REPLACEABLE LED LIGHT ENGINE

Light engine is serviceable without tools. All USAI Lighting light engines feature industry-leading color consistency.

BODY

6"Ø extruded aluminum body available in a variety of powder coated paint finishes. Custom colors also available (provide RAL #).

FRONT CAP

Standard cylinder is provided with snap in diecast assembly retaining wall wash lens in finish specified.

MOUNTING OPTIONS

In all cases hardware included for mounting to 4" octagonal junction box.

SURFACE MOUNT

If the (SM) mounting option is specified, cylinder is provided with a 6"Ø x 1/2" deep round canopy that allows for completely tool-less mounting to a recessed junction box with no visible hardware.

FIELD CUTTABLE RIGID PENDANT STEM MOUNT

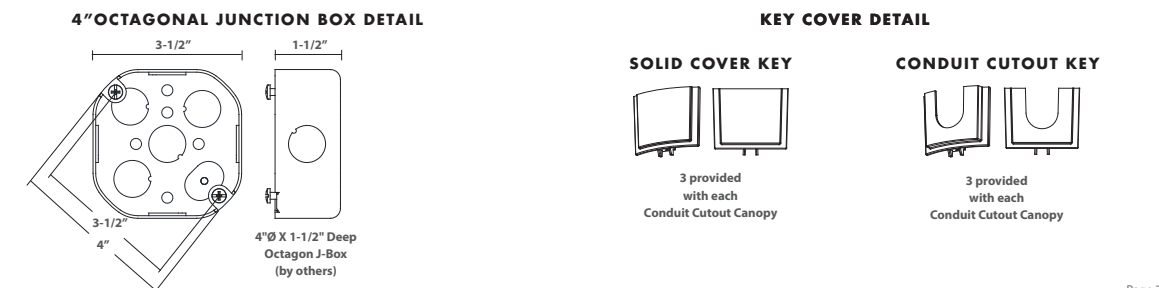
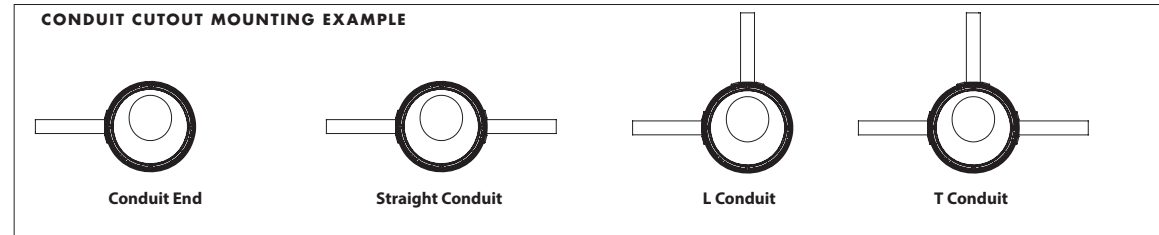
5/8"Ø (3/8" IPS) steel stem is provided in length specified with 30° hang straight. Specify stem 2' Nominal, 4' Nominal, or 8' Nominal length in table when ordering; stem is field cuttable to a minimum length of 6".

RECESSED JBOX PENDANT CANOPY

If recessed J-box canopy style (PR1B, PR2B or PR3B) canopy is specified, 5"Ø x 3/8" deep canopy is provided for mounting to recessed mounted junction box. Recessed J-box canopy is provided in matching finish per fixture body finish specification.

CONDUIT CUTOUT MOUNTING OPTIONS

Conduit cutout mounting fixtures are designed to mount to surface-mounted 4"x 1-1/2" octagonal junction boxes with surface-mounted conduit connections. If the conduit cutout surface mount option (CC) or any of the conduit cutout pendant styles (PJ1B, PJ2B or PJ3B) are specified, BeveLED Cylinder is provided with a 5-13/16"Ø x 2-3/8" deep conduit cutout canopy base in body finish specified. Conduit cutout bases have 4 keyslots, one in each side, and ship with one conduit cutout key and three solid cover keys installed. 2 additional conduit cutout keys are shipped with the fixture; the different key types are interchangeable in the field and can be configured to accommodate any ceiling layout using 1/2" or 3/4" conduit. Conduit cutout bases and canopies are provided in a finish matching body finish specification. Please see installation instructions for drawings and more details.



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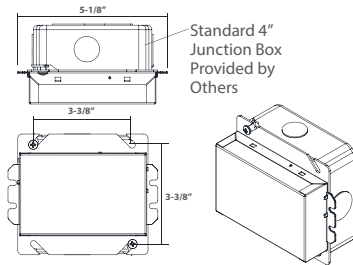
L2

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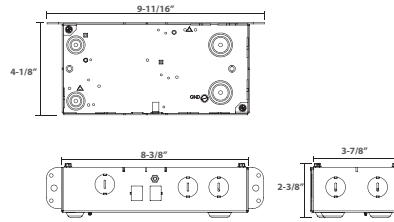
BeveLED[®] 2.2 Cylinder Wall Wash — CBRW10

BEVELED 2.2 CYLINDER SPECIFICATIONS

MP JUNCTION BOX MOUNTING PLATE

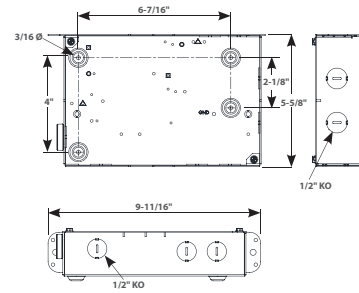


ENC SINGLE DRIVER ENCLOSURE



NOTE: Enclosure shown with removed cover and Power Supply for clarity purposes

ENC WITH EMSEH EMERGENCY BATTERY SHUNT



USAI can also provide prewired enclosures for multiple remote drivers per customer specifications, available in 2 sizes: 21" x 21" x 4" (holds up to 6 drivers) or 38" x 21" x 4" (holds up to 12 drivers). Driver enclosures must be surface mounted and are not for recessed applications. Field wiring should be according to NEC code; per article 411.7, all connections per enclosure must be made to a single branch circuit. EC is responsible for adherence to all local codes. When specifying USAI enclosures, dimming drivers are specified within the enclosure part number specification on page 4 and should not be specified separately using tables on page 3. Refer to remote dimming driver tables for maximum distances, locations, and wire gauges required.

FIXTURE WEIGHT

8 lbs (not including rigid pendant stem accessory).

WARRANTY

Based on IESNA LM80-2008, BeveLED Cylinder has a 50,000 hour rated life at 70% lumen maintenance (L70). USAI Lighting Warranty covers replacement parts for 5 years from date of shipment. Warranty is void if USAI Cylinder is used with any power supply other than that which is provided by USAI.

LISTINGS

Dry/Damp/Wet for SM, PR1B, PR2, PR3B mounting under covered ceilings only. All others Dry/Damp. NRTL/CSA-US tested to UL standards. IBEW union made. All configurations of this product are Buy American Act (BAA) compliant.



NOTES

- Ambient temperatures at fixture location should not exceed 40°C during normal operation.
- For Interior use only

PHOTOMETRICS

Consult factory or website for IES files. Tested in accordance with IESNA LM79-2008.



Spec Guide

Nexa | 807



Direct lighting for general interior applications.



Nexa 3.25", Critical Edge, Clear Anodized

Benefits & Features

Minimal Profile, Seamless Design

Thin profile. Two aperture sizes to choose from 3.25" (83mm) x 0.55" (14mm) and 5.25" (133mm) x 0.55" (15mm).

Superior Light Quality & Performance

Output up to 1650 lm/ ft. 80 or 90 CRI, tunable white (2200K - 5000K), and dim to warm (2200K - 3000K) available.

Dust-Free Optics Available

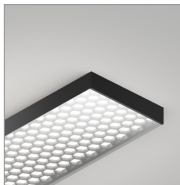
In addition to Vodes original Critical Edge™ and Honeycomb Louver optics, Vode now offers a dust-resistant, wipe-down shield called Clear.

Versatile Mounting Options with Easy Installation

Magnet mount to any surface, compatible with suspended ceiling systems using Vode's adjustable ceiling clips for simple installation.



Nexa 3.25", Honeycomb Louver, Black Anodized



Nexa 3.25", Honeycomb Louver, Black Anodized with Nexa | Clear



Nexa 3.25", Critical Edge, Clear Anodized, Integral Power



Meydenbauer Center: Center Hall Remodel

250028
CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L3

Build Your Specification

807						»»	
System 807 System 807	Rail Type NX3 Nexa 3.25" (83mm) NX5 Nexa 5.25" (133mm)	System Type SL Surface RS Recessed	System Length Change to specify overall system length in ft/in or M/mm. Corner and Shapes Available See Guide for details.	Rail Length 24 24" (610mm) 30 30" (762mm) ¹ 36 36" (914mm) 48 48" (1219mm) 60 60" (1524mm) 72 72" (1829mm) 90 90" (2286mm) ¹ 96 96" (2438mm) ¹¹ 108 108" (2743mm) 120 120" (3048mm) 132 132" (3352mm) 144 144" (3658mm)	ZZ Other rail length or layout (please specify) See Rail Length Chart for more details. ▲ Custom lengths may result in light gaps on the fixture. See Rail Length Chart for more details. Integral Power lengths are not whole numbers at ends of fixture runs to account for T-Bar grid. See Layout on page 10 for details.		
»»			0	»»			
Mounting Surface Mount Drywall & Masonry SM Surface Mount Magnet ² Suspended Ceiling T1 9/16" T-Bar Clip, low profile T5 9/16" T-Bar Clip, medium profile T2 15/16" T-Bar Clip, low profile T3 15/16" T-Bar Clip, medium profile T4 15/16" T-Bar Clip, concealed T6 Slotted T-Bar Clip T7 Dimensional T-Bar Clip DM Armstrong® DynaMax™ Wood Ceilings G1 Grille Regular Vertical Slats 9/16" G2 Grille Regular Horizontal Slats 15/16" G3 Grille Regular Horizontal Slats G4 Grille 1-3/8" Slat G5 Grille 5-1/4" Slat Height G6 Grille 3-1/4" Slat Height	Strut Channel SC Strut Channel Clip Armstrong Ceilings Add an 'A' to the end of the mounting spec code example: G1A, G6A, T1A Recessed Integral Driver ³ RSC Suspended Ceiling, Recessed Armstrong Ceiling ³ RAC Recessed Armstrong Suspended Ceilings (ACT On-Center, TECHZONE™, Formations™, Direct Cove, ACOUSTIBUILT®, Drywall Linear Lighting Kit, and METALWORKS™)	Arm/Cable Length 0 None	Power Location Remote Power RP10 10' (3.04m) Wire Harness RP25 25' (7.62m) Wire Harness RP50 50' (15.24m) Wire Harness RP75 75' (22.86m) Wire Harness RP100 100' (30.48m) Wire Harness Integral Power ³ IP Integral Power				
»»				Z	»»		
Power Type Flexible 1 to 1 Power AE 0-10v, 1.0% Dimming AT 0-10v, 0.1% Dimming AD DALI, 0.1% Dimming AX DMX, 100-0% Dimming AH Hi-lume 1% EcoSystem, LDE ¹ AH2 ELV 1% 2-wire (Forward and Reverse Phase) ^{4 10}	Optimized Power Add an 'O' to the end of the power type spec code. ⁵ example: AEO, ATO, ADO, etc. VodeNODE Add 'N' to power type for Flexible 1 to 1 Power Add 'ON' to power type for Optimized Power ⁵ example: AEN, ATN, AEON, ADON, etc.	Voltage 1 120V 2 120V-277V ZZ Other (please specify)	Emergency Power 0 No emergency power ZZ Emergency power (please specify)	LED Type Z Zipper Board			
»»							
Lumen Output VLO Very Low Output LO Low Output SO Standard Output HO High Output ZZ Other (please specify)	Color Temperature 80+ CRI 27 2700K 30 3000K 35 3500K 40 4000K 90+ CRI 279 2700K 309 3000K 359 3500K 409 4000K TW Tunable White 2200K - 5000K DW Dim to Warm 2200K - 3000K RGBW 90+ CRI ¹³ C279 RGB Color, 2700K C309 RGB Color, 3000K C359 RGB Color, 3500K C409 RGB Color, 4000K ZZ Other (please specify)	Optics CE Critical Edge HL Honeycomb Louver ⁶ HLRG Honeycomb Louver Rose Gold CHL Honeycomb Louver, Clear Lens ^{6, 12}	Sensors 0 None ZZ Sensor (please specify)	Finish ⁷ AL Clear Anodized BL Black Anodized	Options 0 None 9 9' 18/3 Cord and Plug ⁸ CPS Chicago Plenum Fixture Adapter and Power ⁹ CPP Chicago Plenum Power ⁹ CPA Chicago Plenum Fixture Adapter ⁹ ZZ Other (please specify)		
NOTES & LIMITATIONS ¹ Rail length not available for surface mount. ² Each magnet holds approximately 13.34kg (~29 lbs). See Surface Magnet Mount Tech Sheet for more details. ³ Integral Power only available with Nexa3 in recessed ceiling mounting applications. ⁴ VodeNODE enclosure is not available with ELV 1% 2-wire (AH2) Power Type. ⁵ Optimized Power is not available with Hi-lume 1% EcoSystem (AHO) Power Type. ⁶ Available for Nexa3. Consult factory for Nexa5. ⁷ Finish determines color of honeycomb louver. Consult factory for other variations of honeycomb louver finish. ⁸ 9' 18/3 Cord and Plug only available with Remote Power (RP). ⁹ Chicago plenum compatible with remote power only. ¹⁰ Lengths of 24" and shorter are not supported due to driver limitations. Daisy chaining multiple fixtures to achieve minimum load is permitted but may introduce installation complexity—consult factory for layout guidance. ¹¹ Maximum length for Nexa5. For custom lengths, consult factory. ¹² Nexa 807 Clear is not compatible with Integral Power (IP). ¹³ RGBW limited to a maximum of 60" for Standard and High Output							
Listed to UL standards for damp location by a Nationally Recognized Testing Laboratory (NRTL) recognized by OSHA. Certain limitations exist for each Certification. Contact factory for verification.							
Standard 5 Year Limited Warranty. See details here . Contact factory for options on Limited Warranties up to 20 years.							
Nexa™ 807 • Page 2 of 19							
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250028

CONSTRUCTION DOCUMENTS

22 December 2025

Type:

L3

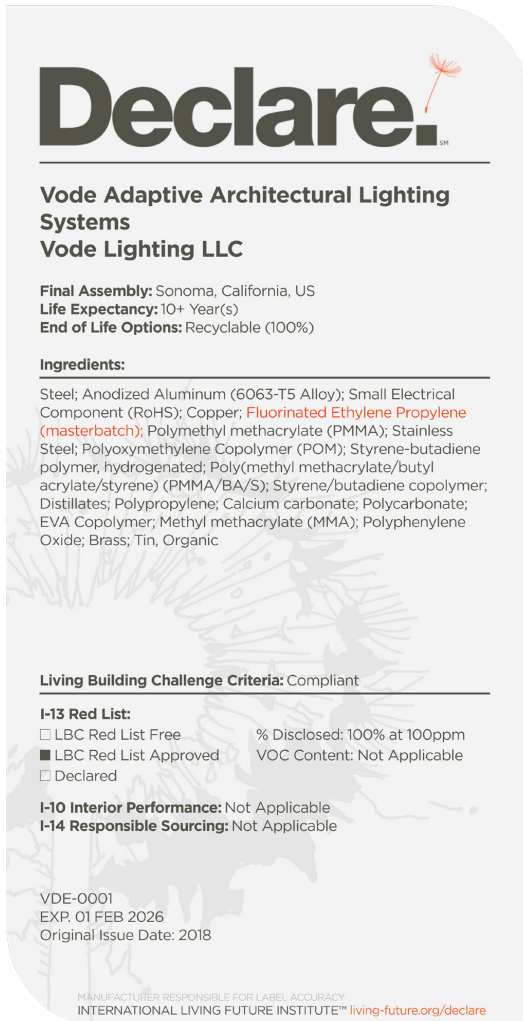
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DECLARE

International Living Future Institute (ILFI)



All Vode Lighting linear light fixtures proudly carry the Red List Approved designation.



BAA X BABA

Buy American Act / Build America & Buy America Act Compliance

Vode is dedicated to supporting domestic manufacturing and ensuring compliance with BAA and BABA requirements.

Given the complexity of our products, we recommend reaching out to **vodecares@vode.com** for confirmation regarding compliance for your specific project.



Click here to learn more: [US Department of Commerce](#)



Meydenbauer Center: Center Hall Remodel

250028

CONSTRUCTION DOCUMENTS

22 December 2025

Type:

L3

Structure

Rail Lengths	Nexa3, 24" (610mm) - 144" (3658mm). Nexa5, 24" (610mm) - 96" (2438mm). Modified lengths available. See Rail Length Chart .
Rail Dimensions	3.25" (83mm) x 0.55" (14mm) x length. 5.25" (133mm) x 0.58" (15mm) x length.
Construction	Extruded and machined 6063 aluminum.
Mounting	Surface Mount Magnet. Each Magnet holds up to 29lbs (13.34kg). T-Bar Clips for most grid / panel construction. Strut Channel Clip. Adjustable T-Bar Clip. See Surface Magnet Mount Tech Sheet for more details.
System Run Length	24" (610mm) minimum. Unlimited maximum.
Operating Temperature	32°F to 104°F (0°C to 40°C).
Humidity	0-95%, non-condensing. Suitable for damp locations.
System Weight	NX3 0.75 lbs/ft. NX5 1 lbs/ft.

Materials

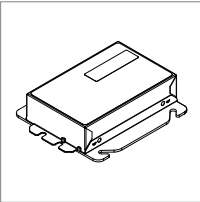
LED Board Construction	Flexboard. RoHS compliant Polyimide Flex PCB substrate.
Lens	High-impact extruded acrylic (PMMA).
Wire Harness	Ø3mm, 18/2 AWG, Plenum (CMP) rated semi-rigid PVC or FEP, flame tested UL-910, red list free.
Cable Connectors	Unfilled black nylon, rated UL 94 V-0, halogen free, PVC or FEP overmold, RoHS compliant, red list free.
Remote Driver Housing	Galvanized Steel.

Power and Controls

Power Type	Class 2 (<60V output) constant current driver.
Dimming Controls	0-10V, DALI, DMX, and others available. See Power Guide for details.
Input Voltage	120V - 277V, 50/60hz.
Power Location	Remote power. Maximum remote distance up to 100' (31m) depending on driver selection. See Power Guide for details.

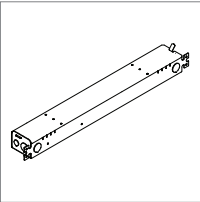
Remote power is locating the power supply away from the fixture. Remote power comes in three housing styles: brick style, linear style and VodeNODE. Consult [Power Guide](#) to determine which type you will receive.

Remote Brick Power Housing



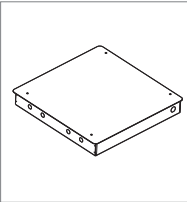
Supplied for some remote power applications. One remote power supply housing is supplied for each rail. Provided driver mounting plate fits standard 4" metal, square J-Boxes with a minimum volume of 21 in³ (J-Box not provided). See [Tech Sheet](#) for details.

Remote Linear Power Housing



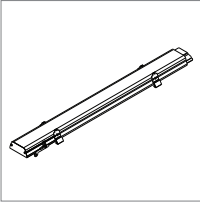
One remote power supply housing is supplied with each power supply. All Vode linear remote drivers come in a 0.054" (0.8mm) formed galvanized steel power supply housing with five (5) knockouts: (4) 1-1/8", (1) 7/8" and (1) 9/16". Accommodates standard linear power supplies. See [Tech Sheet](#) for details.

VodeNODE



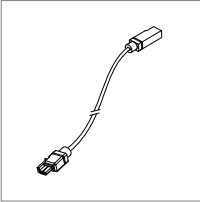
White powder coated, aluminum power enclosure with up to 600W maximum load. Fits most Vode standard linear drivers. Drivers are supplied prewired for ease of installation. See [Tech Sheet](#) for details.

Integral Power



One integral power housing is supplied to match the length of the fixture. The linear driver inside the power chassis can allow for single units or continuous runs. Available for Armstrong On Center only. See [Tech Sheet](#) for details.

Wire Harness



Wire harness connects driver to rail section. Lengths of 10' (3.0m) & 25' (7.6m) with snap-lock connectors for quick and easy installation. Multiple harnesses may be combined for lengths up to 100' (30.5m). See [Tech Sheet](#) for details.



Meydenbauer Center: Center Hall Remodel

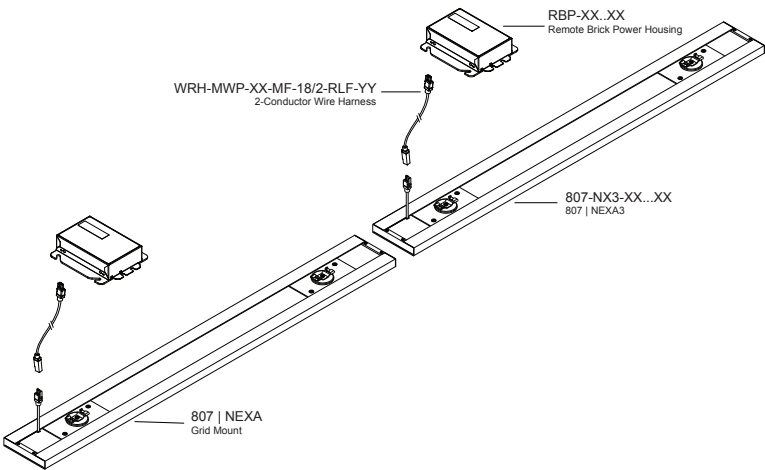
250028
CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L3

Power and Controls

Flexible 1 to 1 power

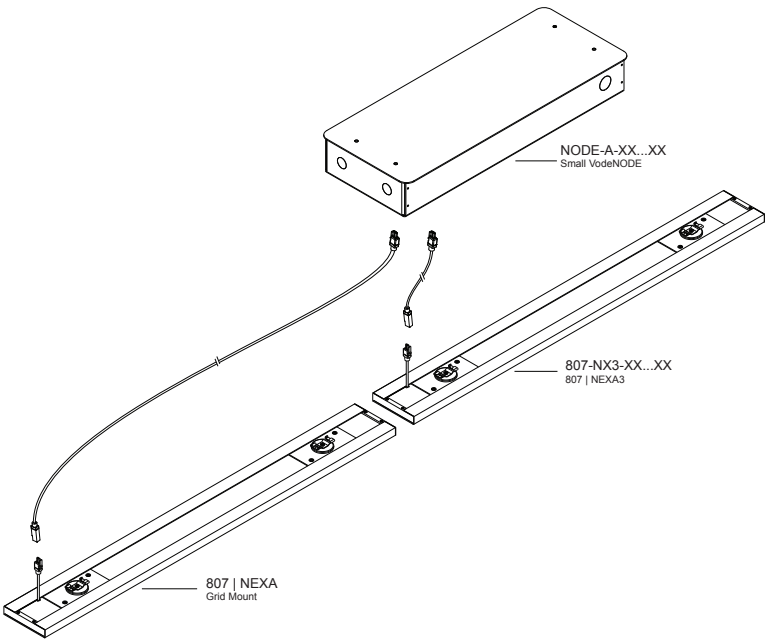
For Flexible 1 to 1 Power, Vode supplies one single output driver per rail, allowing each rail to be controlled independently. Direct rails are supplied with two single output drivers, allowing the direct lighting to be controlled independently. Consult [Power Guide](#) to determine which type you will receive.



Optimized Power

To optimize power, Vode configures specifications with drivers that have 2 or 4 outputs. Depending on system configurations and power requirements, up to 4 fixtures can be powered from a 4-output driver. Consult [Power Guide](#) to determine which type you will receive.

Notes: Each rail will still require individual wire harnesses, as shown below. VodeNODE is not required for optimized power.



Notes: Drawings not to scale, for reference only.



Meydenbauer Center: Center Hall Remodel

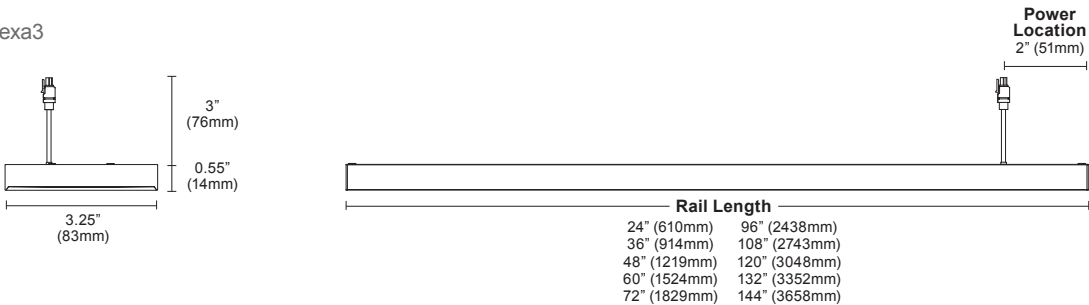
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22 December 2025

Type:
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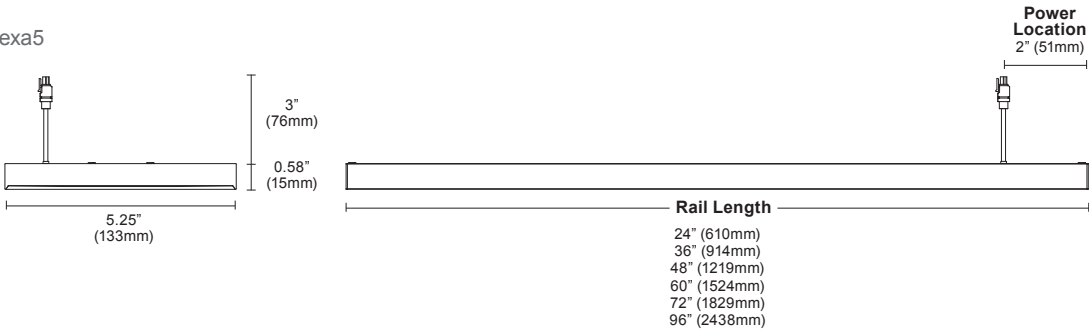
Dimensions

Remote Power

Nexa3



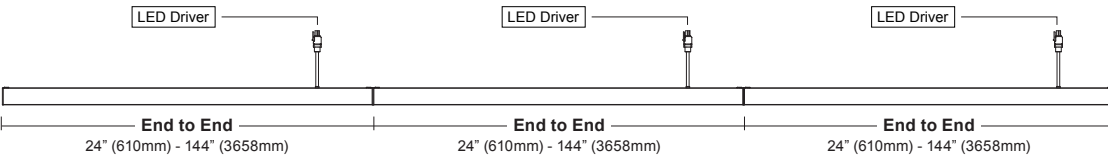
Nexa5



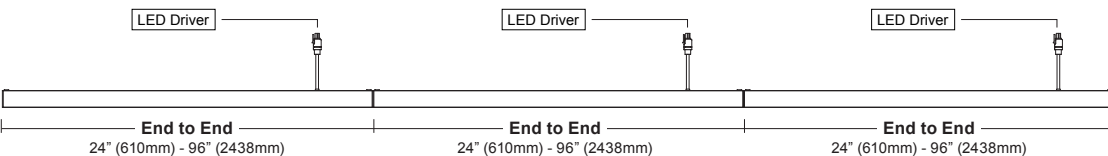
Layout

Remote Power

Nexa3



Nexa5



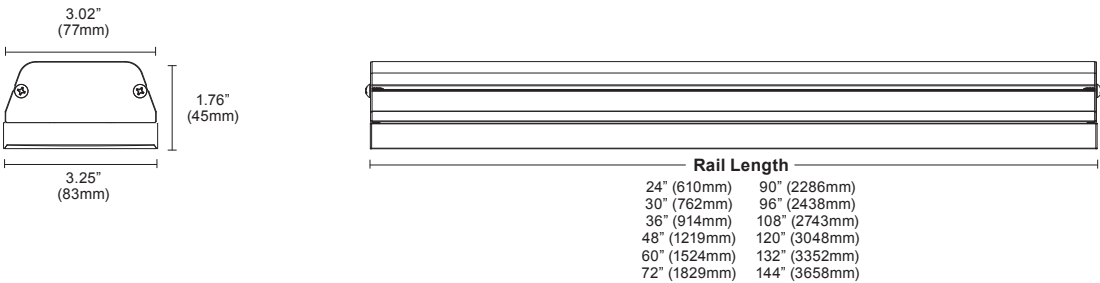
Meydenbauer Center: Center Hall Remodel

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CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L3

Dimensions

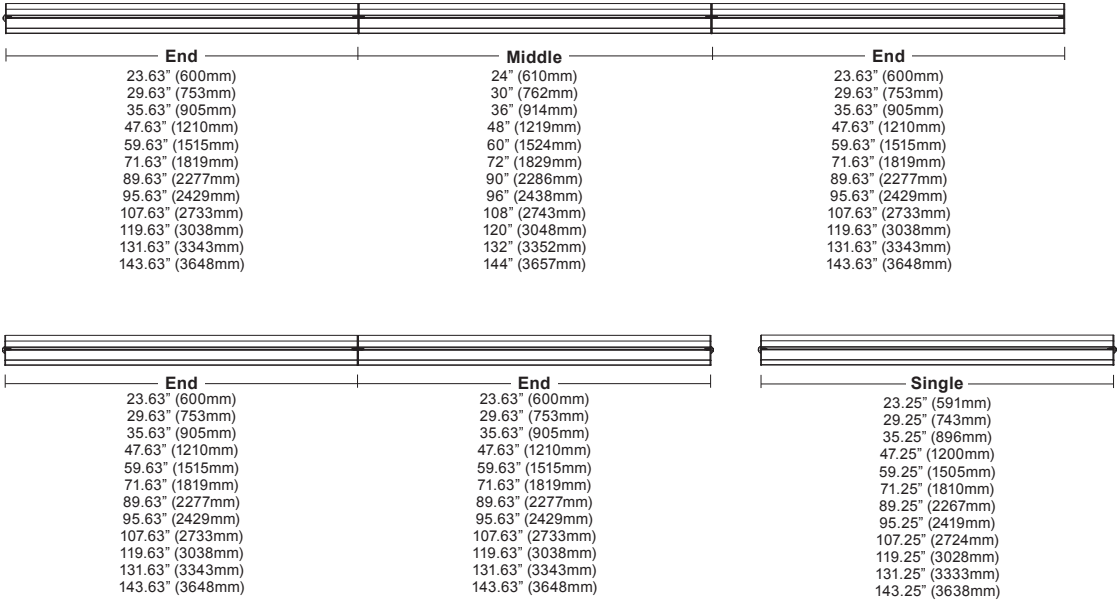
Integral Power



Layout

Integral Power

Note: Dimensions are not whole numbers at ends of fixture runs to account for T-Bar grid.

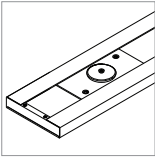


Meydenbauer Center: Center Hall Remodel

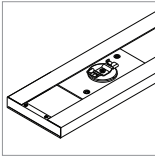
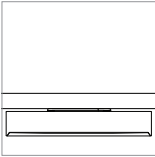
250028
CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L3

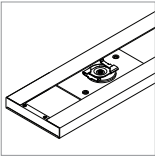
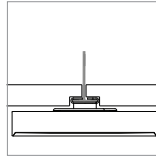
Mounting Options



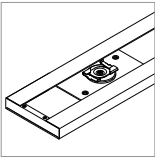
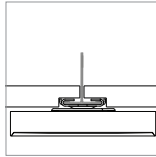
Surface Magnet Mount (SM)



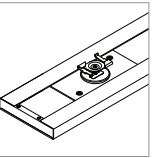
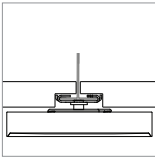
9/16" T-Bar Clip, Low Profile (T1)



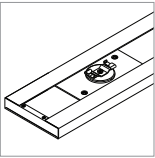
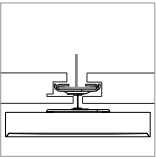
15/16" T-Bar Clip, Low Profile (T2)



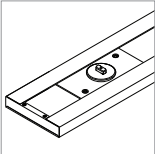
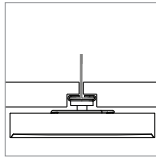
15/16" T-Bar Clip, Medium Profile (T3)



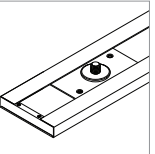
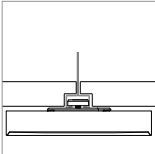
15/16" T-Bar Clip, Concealed (T4)



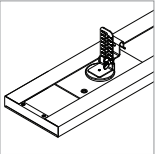
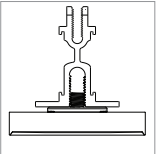
9/16" T-Bar Clip, Medium Profile (T5)



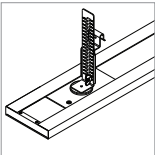
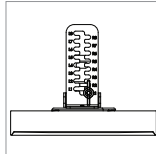
Slotted T-Bar Clip (T6)



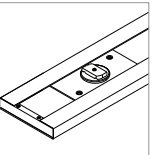
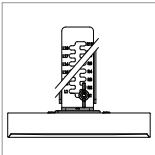
Armstrong Dynamax (DM)



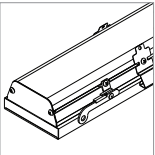
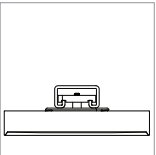
Adjustable T-Bar Clip, Small (G1-G6)



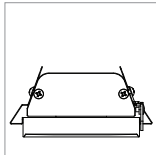
Adjustable T-Bar Clip, Large (G1-G6)



Strut Channel Clip (SC)



Suspended Ceiling, Recessed (RSC)
Recessed Armstrong Suspended Ceilings (RAC)



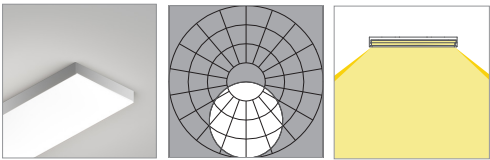
Meydenbauer Center: Center Hall Remodel

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Type:
L3

Performance | Zipper Board Optics

Nexa 3.25", Critical Edge, Clear Anodized



L80 >60,000 hours

Low Output (LO)	80 CRI (80min., 84 avg.)				90 CRI (90min., 96 avg.)			
	2700K	3000K	3500K	4000K	2700K	3000K	3500K	4000K
Efficacy - Lumens per Watt	120	124	126	126	101	104	106	107
Lumens per foot (305mm)	395	407	415	415	331	342	349	352
Watts per foot (305mm)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3

Standard Output (SO)	80 CRI (80min., 84 avg.)				90 CRI (90min., 96 avg.)			
	2700K	3000K	3500K	4000K	2700K	3000K	3500K	4000K
Efficacy - Lumens per Watt	120	124	126	126	101	104	106	107
Lumens per foot (305mm)	789	814	831	831	663	684	698	705
Watts per foot (305mm)	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6

High Output (HO)	80 CRI (80min., 84 avg.)				90 CRI (90min., 96 avg.)			
	2700K	3000K	3500K	4000K	2700K	3000K	3500K	4000K
Efficacy - Lumens per Watt	153	158	161	161	128	132	135	136
Lumens per foot (305mm)	1500	1547	1578	1578	1259	1299	1326	1339
Watts per foot (305mm)	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9



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Type:
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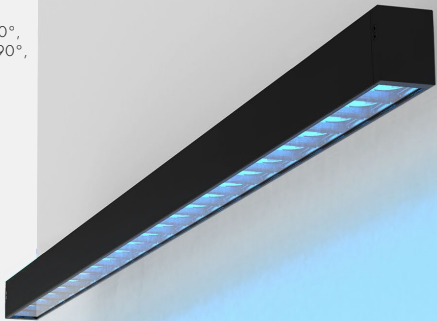
PROJECT: TYPE: CATALOG #: MI - - - - - Q - - - - -

PROFILE

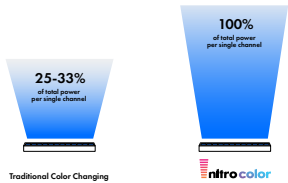
- LIGHT SOURCE3.5 W/FT, 9.0 W/FT, 15.0 W/FT
- OPTICAL DISTRIBUTIONS10° X 10°, 10° X 60°, 10° X 90°, 20° X 20°, 20° X 60°, 40° X 40°, 40° X 60°, 40° X 90°, 60° X 60°, 60° X 90°, 80° X 80°, ASYMMETRIC GRAZE, DIRECT VIEW
- CCTPATENTED QUAD PERECT™ TECHNOLOGY
POWERED BY NITRO COLOR TECHNOLOGY
RGB-AMBER, RGB22K, RGB27, RGB30K, RGB35K, RGB40K, RG-ROYAL BLUE30K, RG-ROYAL BLUE-40K , TUNABLE WHITE (2200K-6500K)
- VOLTAGE120V OR 277V
- POWERINTEGRAL POWER SUPPLY
- CONTROLDMX+RDM
- LENGTHS12", 24", 36", 48", 60", 72", 84", 96"
- WEIGHT2.75 LB (1.25 KG) PER FOOT
- HOUSINGPRECISION EXTRUDED ALUMINUM
- LENSHIGH DENSITY ACRYLIC LENS
- FINISHHIGH DURABILITY POWDER COATING
- OPERATING TEMP-20° C TO 40° C
- WARRANTY5-YEAR LIMITED
- CERTIFICATIONETL AND CETL FOR DRY OR DAMP LOCATION



POWERED BY
nitrocolor QUAD PERFECT



NITRO COLOR TECHNOLOGY



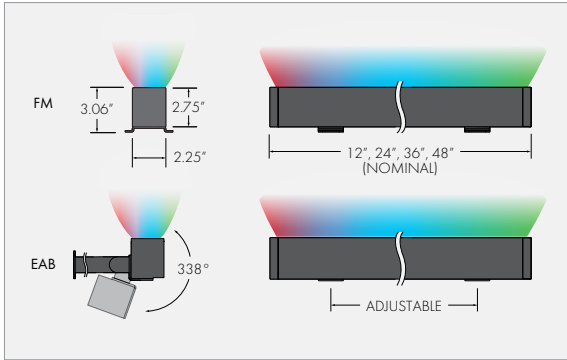
PATENTED QUAD PERFECT™ TECHNOLOGY

The Quad Chip Array integrates multiple colors (i.e. red, green, blue, white) into a single location for immediate and superior color saturation. Ideal for direct line of sight applications where the face of the fixture is visible. Provides smooth color saturation/ mixing on the perpendicular wall. Creates color consistency between the luminaire and the illuminated surface. LED color combinations may be customized to suit any application (ex: royal blue, cyan, yellow, and white).

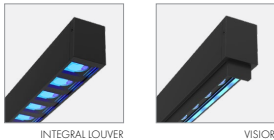


PROFILE

Not all available mountings shown



OPTIONS



PERFORMANCE SAMPLE

[Go to Performance Data >](#)

4', HIGH OUTPUT	RGB40 (FULL)	RED	GREEN	BLUE	WHITE
DISTRIBUTION	10°X10°	10°X10°	10°X10°	10°X10°	10°X10°
LUMENS	2430	1364	3154	462	3057
EFFICACY L/W	40.13	26.89	51.68	793	52.06
PEAK CANDELA	22249	12440	28865	3943	28054

Revised May 8, 2025
Specifications subject to change without notice



Meydenbauer Center: Center Hall Remodel

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Type:
L4

PROJECT: TYPE: CATALOG #: MI - - - Q - - - - - - - -

SPECIFICATION

MIQ

1

2

3

4

5

6

7

8

9

10

11

12

<div>1</div> <div><div>FIXTURE</div><div>STRUCTURE GRAZE</div><div>MI</div></div>	<div>5</div> <div><div>OPTICAL DISTRIBUTION</div><div>10° X 10°1010</div><div>10° X 60°1060</div><div>10° X 90°1090</div><div>20° X 20°2020</div><div>20° X 60°2060</div><div>20° X 90°2090</div><div>40° X 40°4040</div><div>40° X 60°4060</div><div>40° X 90°4090</div><div>60° X 60°6060</div><div>80° X 80°8080</div><div>ASYM GRAZE UPLIGHT, LEFT POWER FEED ¹ASUL</div><div>ASYM GRAZE UPLIGHT, RIGHT POWER FEED ¹ASUR</div><div>ASYM GRAZE DOWNLIGHT, LEFT POWER FEED ¹ASDL</div><div>ASYM GRAZE DOWNLIGHT, RIGHT POWER FEED ¹ASDR</div><div>¹ Asym Graze: See page 3 for details.</div><div>DIRECT VIEW FLAT WHITE LENS ¹WL</div><div>WL option is only available with Medium Output</div><div>WL option has a LLF of 30%</div><div>¹ Asym Graze: See page 3 for details.</div></div>	<div>7</div> <div><div>FIXTURE LENGTH</div><div>12"12</div><div>24"24</div><div>36"36</div><div>48"48</div><div>60"60</div><div>72"72</div><div>84"84</div><div>96"96</div><div>CONTINUOUS RUN</div><div>Specify run length in twelve inch increments</div><div>Continuous Run (CR) option must be included</div><div>See max number of fixtures per power feed, page 5</div></div>	<div>10</div> <div><div>FIXTURE FINISH</div><div>TEXTURED WHITETWH</div><div>TEXTURED BLACKTBL</div><div>TEXTURED BRONZETBR</div><div>TEXTURED LIGHT BRONZETLB</div><div>TEXTURED GRAYTGR</div><div>TEXTURED NATURALTNA</div><div>TEXTURED SANDSTONETSA</div><div>ANODIZED ALUMINUMANA</div><div>Includes corrosion resistant finish.</div><div>CUSTOM COLORCUS</div><div>Contact factory for custom color. Additional charges will apply.</div></div>
<div>2</div> <div><div>WATTAGE</div><div>LOW OUTPUTLO</div><div>3.5 W/FT</div><div>MEDIUM OUTPUTMO</div><div>9.0 W/FT</div><div>HIGH OUTPUTHO</div><div>15.0 W/FT</div></div>			<div>11</div> <div><div>CANOPY FINISH</div><div>TEXTURED WHITETWH</div><div>TEXTURED BLACKTBL</div><div>TEXTURED BRONZETBR</div><div>TEXTURED LIGHT BRONZETLB</div><div>TEXTURED GRAYTGR</div><div>TEXTURED NATURALTNA</div><div>TEXTURED SANDSTONETSA</div><div>CUSTOM COLORCUS</div><div>Contact factory for custom color. Additional charges will apply.</div></div>
<div>3</div> <div><div>CCT</div><div>RED, GREEN, BLUE, AMBERRGBAM</div><div>RED, GREEN, BLUE, 22KRGB22</div><div>RED, GREEN, BLUE, 27KRGB27</div><div>RED, GREEN, BLUE, 30KRGB30</div><div>RED, GREEN, BLUE, 35KRGB35</div><div>RED, GREEN, BLUE, 40KRGB40</div><div>RED, GREEN, ROYAL BLUE, 30KRGY30</div><div>RED, GREEN, ROYAL BLUE, 40KRGY40</div><div>TUNABLE WHITE2265K</div><div>Kelvin tunable 2200K-6500K</div><div>Contact factory for additional CCT combinations</div></div>	<div>6</div> <div><div>MOUNTING</div><div>FIXED MOUNTFM</div><div>Available as a single fixture only</div><div>HINGE Mounthm</div><div>SURFACE MOUNT, BACKSMB</div><div>EXTENDED ARM, BACKEAB-X</div><div>AIRCRAFT CABLE ¹AM-X</div><div>PENDANT ¹PM-X</div><div>¹ Aircraft cable and pendant mount are available as downlight only</div></div>	<div>9</div> <div><div>CONTROL OPTIONS</div><div>DMX SYSTEM RESOLUTIONDMXSX</div><div>DMX FIXTURE RESOLUTIONDMXFX</div><div>DMX FT BY FT RESOLUTIONDMXFT</div><div>Default factory setting is DMX System Resolution</div><div>Fixtures are not pre-addressed/labelled at the factory. A DMXCAT tool is required for on-site fixture resolution/addressing. See page 4 for details.</div><div>A CDS/RDM Distribution Kit is required. Must be ordered separately. See page 4 for details.</div><div>DMX controls are required. Order separately.</div></div>	<div>12</div> <div><div>OPTIONS</div><div>INTEGRAL LOUVERILV</div><div>Integral low profile louver</div><div>20% light loss factor with louver</div><div>Finish to match fixture housing</div><div>Not available with Asymmetric distribution</div><div>Integral louver cannot be combined with Visor (VS)</div><div>VISORVS</div><div>Visor comes installed on fixture and the orientation can be adjusted during installation.</div><div>Visor cannot be combined with Integral Louver (ILV)</div><div>Visor finish to match fixture housing</div><div>CONTINUOUS RUNCR</div><div>See maximum number of fixtures per power feed location on page 5.</div></div>
<div>4</div> <div><div>LED CONFIGURATION</div><div>QUAD CLUSTERQ</div></div>			

ORDERING LOGIC: DMX TOOLS - REQUIRED

<div>1</div> <div><div>DMX/RDM DISTRIBUTION KIT</div><div>CDS-RDM - DMX/RDM DISTRIBUTION KIT - IP67</div><div>SA27411</div><div>Consists of 4 output</div><div>Each output is limited to (1) run per output - up to 32 fixtures max</div></div>	<div>1</div> <div><div>REMOTE DMX/RDM MONITORING TOOL</div><div>DMX/RDM ADDRESSING & MONITORING TOOL</div><div>SA27636</div><div>Uses Bluetooth LE technology for communication with the smartphone and the DMXcat app (up to a 50' range). Allows for on-site fixture resolution and addressing.</div></div>
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PROJECT:

TYPE:

CATALOG #: MI - - Q - - - - - - - - -

PERFORMANCE

		LOW OUTPUT (3.5 W/FT) - 48" FIXTURE				MEDIUM OUTPUT (9.0 W/FT) - 48" FIXTURE				HIGH OUTPUT (15.0 W/FT) - 48" FIXTURE			
OPTICS	CCT	TOTAL WATTAGE	LUMENS	LM/W	PEAK CANDELA	TOTAL WATTAGE	LUMENS	LM/W	PEAK CANDELA	TOTAL WATTAGE	LUMENS	LM/W	PEAK CANDELA
10° X 10°	TUNABLE WHITE	16.00	804	50.66	14938	40.80	2067	50.66	38467	68.00	3445	50.66	64112
	RGB40 FULL	16.26	570	35.06	5138	36.86	1454	39.45	13090	60.55	2430	40.13	22249
	RED	16.05	446	27.79	4006	35.97	1030	28.63	9312	50.72	1364	26.89	12440
	GREEN	16.57	756	45.62	6816	37.34	1905	51.02	17201	61.03	3154	51.68	28865
	BLUE	15.88	102	6.42	856	35.74	267	7.47	2245	58.29	462	7.93	3943
	WHITE	15.97	739	46.27	6653	35.98	1861	51.72	16770	58.72	3057	52.06	28054
10° X 60°	TUNABLE WHITE	16.00	692	42.40	2530	2.00	1781	42.40	6514	70.00	2968	42.40	10857
	RGB40 FULL	16.14	449	30.92	1157	36.68	1304	35.55	3304	60.79	2193	36.08	5542
	RED	16.05	386	24.05	1286	35.92	911	25.36	2329	50.85	1213	23.85	3086
	GREEN	16.70	677	40.54	1734	37.33	1733	46.42	4379	60.90	2845	46.72	7167
	BLUE	15.92	87	5.46	211	35.75	235	6.57	562	58.31	402	6.89	955
	WHITE	15.92	653	41.02	1695	35.97	1680	46.71	4310	58.71	2740	46.67	6999
10° X 90°	TUNABLE WHITE	13.00	560	43.67	1244	33	1441	43.67	3204	55.00	2402	43.67	5340
	RGB40 FULL	15.99	504	31.52	776	35.70	1302	36.47	1999	60.51	2069	34.19	3235
	RED	16.04	393	24.50	608	35.91	901	25.09	1399	50.55	1121	22.18	1760
	GREEN	16.57	686	41.40	1051	37.30	1726	46.27	2651	60.88	2746	45.11	4277
	BLUE	15.88	89	5.60	130	35.74	233	6.52	343	58.23	387	6.65	573
	WHITE	15.97	666	41.70	1029	35.97	1674	46.54	2599	58.65	2642	45.05	4169
20° X 20°	TUNABLE WHITE	16.00	824	51.94	6658	40.80	2119	51.94	17146	68.00	3532	51.91	28576
	RGBW FULL	14.50	485	33.45	2216	36.47	1395	38.25	6403	61.15	2385	39.00	11005
	RED	16.10	300	18.63	1369	35.90	874	24.35	3870	51.49	1502	29.17	6652
	GREEN	16.40	700	42.68	3199	37.30	1959	52.52	9106	60.64	3367	55.52	15651
	BLUE	15.25	100	6.56	458	35.77	283	7.91	1284	58.73	486	8.28	2206
	WHITE	15.90	681	42.83	3112	35.97	1955	54.35	9091	59.15	3360	56.80	15626
20° X 60°	TUNABLE WHITE	16.00	742	46.75	1621	40.80	1907	46.75	4175	68.00	3179	46.75	6959
	RGB40 FULL	14.45	423	29.27	757	36.38	1223	33.62	2190	60.60	2069	34.14	3740
	RED	16.10	262	16.27	467	35.80	756	21.12	1353	51.40	1279	24.88	2310
	GREEN	16.40	611	37.26	1093	37.20	1765	47.45	3160	60.60	2987	49.29	5398
	BLUE	15.25	88	5.77	156	35.40	253	7.15	452	58.40	428	7.33	773
	WHITE	15.90	595	37.42	1063	35.90	1717	47.83	3075	59.10	2906	49.17	5252
20° X 90°	TUNABLE WHITE	12.00	586	49.22	931	30.60	1506	49.22	2398	51.00	2510	49.22	3996
	RGB40 FULL	14.70	420	28.57	517	36.47	1197	32.82	1483	61.0	2015	33.03	2471
	RED	16.10	259	16.09	319	35.80	740	20.67	916	51.50	1245	24.17	1526
	GREEN	16.40	605	36.89	747	37.10	1728	46.58	2140	60.10	2909	48.40	3566
	BLUE	15.25	87	5.70	107	35.60	248	6.97	306	58.70	417	7.10	510
	WHITE	15.90	589	37.04	727	35.90	1681	46.82	2082	59.10	2830	47.88	3469
40° X 40°	TUNABLE WHITE	16.00	863	54.43	1203	40.80	2221	54.43	3098	68.00	3701	54.43	5163
	RGB40 FULL	14.70	563	38.30	760	36.37	1551	42.65	2426	60.65	2618	43.17	3540
	RED	16.10	348	21.61	469	35.60	958	26.91	1489	50.77	1596	31.44	2128
	GREEN	16.40	812	49.51	1097	37.30	2239	60.03	3479	61.18	3868	63.22	6157
	BLUE	15.20	116	7.63	157	35.40	321	9.07	498	59.12	532	9.00	830
	WHITE	15.80	790	50.00	1068	35.80	2178	60.84	3385	59.26	3718	62.74	5741
40° X 60°	TUNABLE WHITE	16.00	774	48.76	628	40.80	1990	48.76	1616	68.00	3316	48.76	2694
	RGB40 FULL	14.30	503	35.17	421	36.30	1395	38.43	1169	60.49	2339	38.67	1961
	RED	16.10	311	19.32	260	35.70	862	24.15	722	50.10	1445	28.84	1211
	GREEN	16.20	725	44.75	608	37.10	2013	54.26	1688	60.80	3376	55.53	2830
	BLUE	15.30	104	6.80	87	35.50	288	8.11	241	58.50	484	8.27	405
	WHITE	15.80	706	44.68	591	35.90	1958	54.54	1642	59.40	3284	55.29	2753
40° X 90°	TUNABLE WHITE	12.00	600	49.46	456	31.20	1543	49.46	1173	52.00	2572	49.46	1955
	RGB40 FULL	14.10	459	32.55	308	36.30	1275	35.12	857	59.93	2138	35.67	1438
	RED	16.10	284	17.64	190	35.70	788	22.07	529	50.10	1321	26.37	888
	GREEN	16.20	663	40.93	445	37.10	1840	49.60	1237	60.80	3086	50.76	2074
	BLUE	15.30	95	6.21	63	35.50	264	7.44	177	58.50	440	7.52	297
	WHITE	15.80	645	40.82	433	35.90	1790	49.86	1203	59.40	3002	50.54	2018
60° X 60°	TUNABLE WHITE	16.00	854	53.81	762	40.80	2195	53.81	1963	68.00	3659	53.81	3271
	RGB40 FULL	14.00	295	21.07	301	36.00	1375	38.19	1401	61.10	2304	37.71	2350
	RED	16.00	182	11.38	186	35.00	849	24.26	865	51.00	1424	27.92	1451
	GREEN	16.00	426	26.63	434	37.00	1984	53.62	2022	61.00	3326	54.52	3390
	BLUE	15.00	61	4.07	62	35.00	284	8.11	289	58.00	477	8.22	485
	WHITE	16.00	415	25.94	422	36.00	1930	53.61	1967	59.00	3236	54.85	3298
60° X 90°	TUNABLE WHITE	16.00	555	34.99	346	40.80	1427	34.99	890	68.00	2379	34.99	1484
	RGB40 FULL	14.00	236	16.86	145	36.00	1097	30.47	675	60.89	1838	30.19	1133
	RED	16.00	145	9.06	89	35.00	678	19.37	417	51.00	1136	22.27	699
	GREEN	16.00	340	21.25	209	37.00	1583	42.78	975	61.00	2654	43.51	1634
	BLUE	15.00	49	3.27	30	35.00	227	6.49	139	58.00	380	6.55	234
	WHITE	16.00	331	20.69	203	36.00	1540	42.78	948	59.00	2582	43.76	1590
80° X 80°	TUNABLE WHITE	16.00	784	49.43	503	40.80	2017	49.43	1295	68.00	3361	49.43	2159
	RGB40 FULL	14.00	219	15.64	161	36.00	609	16.92	449	60.65	1021	16.83	753
	RED	16.00	136	8.50	100	35.00	376	10.74	277	51.00	631	12.37	465
	GREEN	16.00	317	19.81	233	37.00	879	23.76	14648	61.00	1474	24.16	1087
	BLUE	14.00	45	3.21	33	35.00	126	3.60	92	58.00	211	3.64	155
	WHITE	16.00	308	19.25	227	35.00	855	24.43	630	59.00	1434	24.31	1057

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Specifications subject to change without notice



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Type:

L4

PROJECT:

TYPE:

CATALOG #: MI - - - Q - - - - - - -

WIRING

MAXIMUM FIXTURES (PER POWER FEED LOCATION)					
LOW OUTPUT (3.5 W/FT)		MEDIUM OUTPUT (9.0 W/FT)		HIGH OUTPUT (15.0 W/FT)	
120V	277V	120V	277V	120V	277V
32 FIXTURES	32 FIXTURES	32 FIXTURES	32 FIXTURES	UP TO 32 FIXTURES	UP TO 32 FIXTURES
				NOT TO EXCEED 1200 WATTS	NOT TO EXCEED 1200 WATTS



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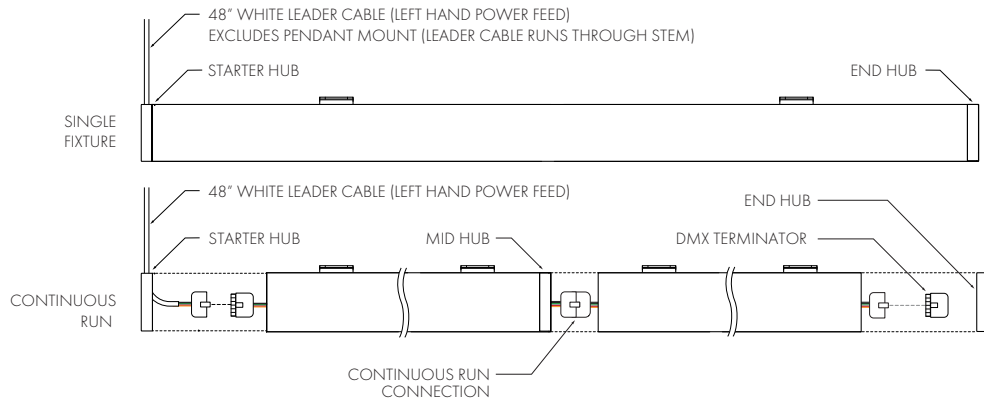
Type:
L4

FIXED MOUNT (FM) - 12" FIXTURE LENGTH A 48" white leader cable (left hand power feed) is provided on all fixtures



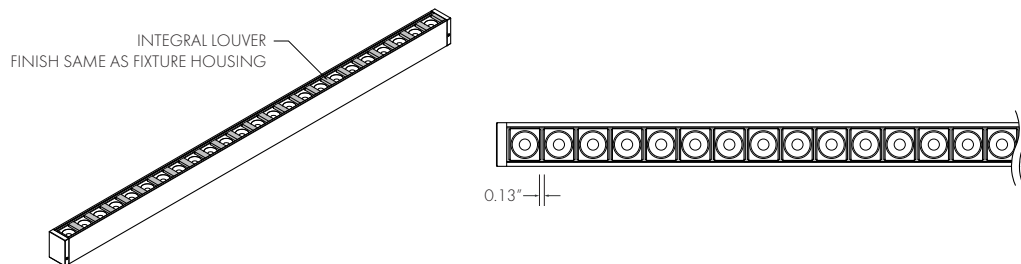
INSTALLATION SUMMARY

A 48" white leader cable (left hand power feed) is provided on all fixtures



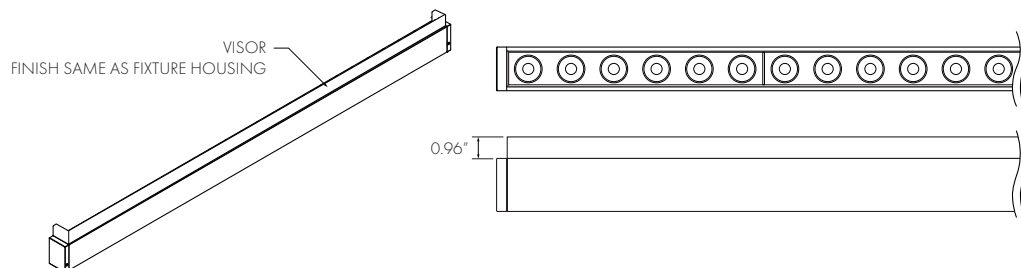
ACCESSORY OPTIONS

INTEGRAL LOUVER (ILV)



VISOR (VS)

Visor available in up to 4 ft. lengths – multiple visors required for fixtures longer than 4 ft.



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insight lighting
4341 Fulcrum Way NE, Rio Rancho New Mexico 87144
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PROJECT: TYPE: CATALOG #: LIGHTDIAL -

PROFILE

The feature rich lighting controller has been designed to provide a control solution for the most demanding of projects, while still maintaining an easy to use panel of touch sensitive buttons.

The controller integrates a graphical color screen allowing scene photos to be displayed.

Easily view the selected zone, scene name and design without the need to navigate through complex menus. Change the speed, color and dimmer using the circular palette.

The lighting levels, color and effects can be programmed from a PC, Mac, Android, iPad or iPhone using the included software.

INPUT POWER	6-7V DC 0.6A
OUTPUT PROTOCOL	DMX512 (X2)
PROGRAMABILITY	PC, MAC, TABLET, SMARTPHONE
DIMENSIONS	4.17 in x 5.75 in x 0.43 in (106mm x 146mm x 10mm)
WEIGHT	9 oz (250g)
COLORS	WHITE (CONTACT FACTORY FOR BLACK)
CONNECTIONS	USB, ETHERNET
COMMUNICATION	RS232, CLOCK, 8 DRY
OPERATING TEMP	14° F TO 113° F (-10° C TO 45° C)
CERTIFICATION	EC, EMC, ROHS, ETL
WARRANTY	2 YEAR LIMITED



KEY FEATURES

- Sleek glass design which sits 11 mm from the wall
- Graphical color display to show selected environment
- Color/dimmer/speed palette
- Color temperature mixing
- Touch sensitive buttons. No mechanical parts
- Touch sensitive wheel allows for accurate color selection
- Multi-zone microSD memory
- Multi-room control with 500 scenes, 10 zones
- 1024 DMX channels. Control 340 RGB fixtures
- USB & Ethernet connectivity for programming and control
- RS232, Dry Contact Ports and an Infra Red input port
- Clock and calendar with Sunrise/Sunset triggering
- Network communication. Control lighting remotely
- Catalog of designs including black and white glass
- OEM customization of the color palette and logo
- Windows/Mac software to set dynamic colors/effects
- iPhone/iPad/Android remote and programming apps
- Programmability PC, Mac, Tablet, Smartphone
- Contact ports, 5v Output
- Relay
- Memory microSD card
- Mounting Single or double gang
- Wall socket

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Type:

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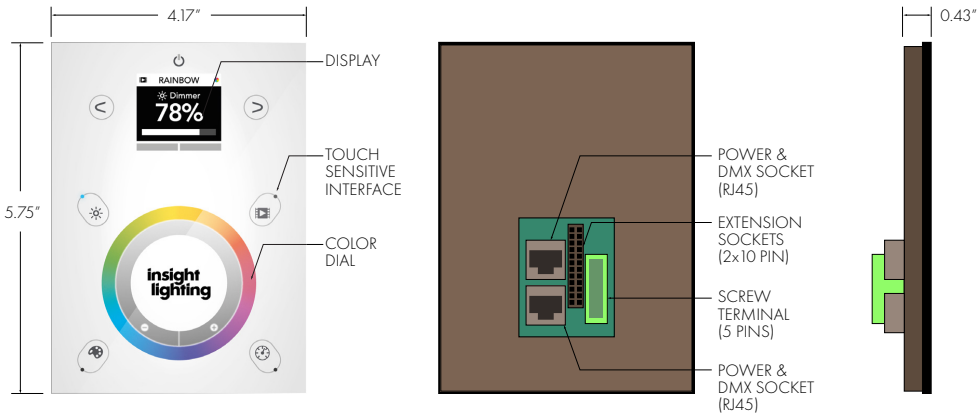
PROJECT:	TYPE:	CATALOG #:	LIGHTDIAL -
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SPECIFICATION

LD	
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1

SYSTEM	
LIGHTDIAL CONTROLLER	LD



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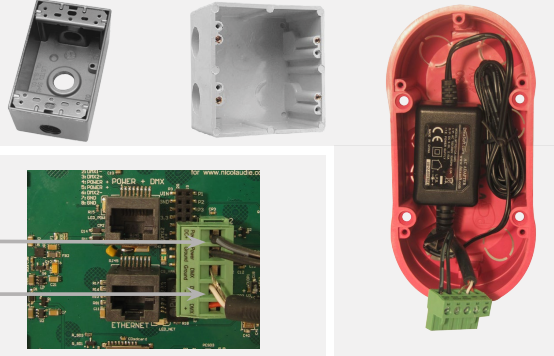
Type:
L4-Controller

PROJECT: TYPE: CATALOG #:

EASY INSTALLATION

1. Mount an electrical box inside the wall

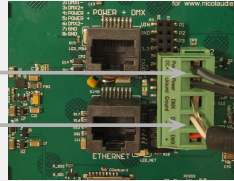
The controller can be installed in any standard electrical backbox. If you use a double size box, you can insert the power supply inside.



2. Connect the wires

POWER: Connect a 5.5V or 6V DC 0.6A ACDC supply. Be sure to not invert the + and the ground.

DMX: Connect the DMX cable to the lighting receivers (Leds, Dimmers, Fixtures..) (for XLR: 1=ground 2=dmx- 3=dmx+)



3. Mount the interface on the wall

First, mount the back side of the interface on the wall with 2 or more screws

Secondly, plug the connectors :

- DMX and power (connector block or RJ45)
- Ethernet cable

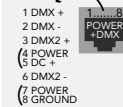
The front panel is mounted by pressing it against the back plate and then sliding down. 2 screws should then be attached underneath to hold the controller in place.



POWER+DMX WITH THE CONNECTOR BLOCK



POWER+DMX WITH THE RJ45 CABLE



****CHECK PIN CONFIGURATIONS. APPLYING POWER TO THE DMX INPUT WILL DAMAGE THE CONTROLLER****
****MAKE SURE THE CONTROLLER IS MOUNTED WITHOUT TOO MUCH FORCE BEHIND AS THIS CAN PUSH APART THE GLASS****

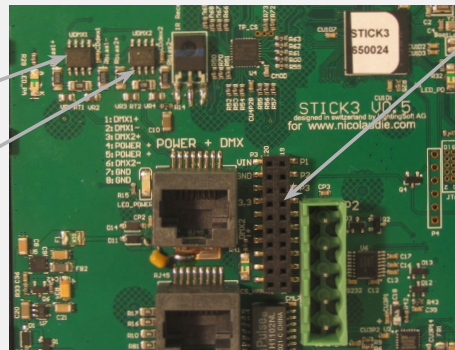
2x10 pins EXTENSION socket

DMX CHIP replacement

DMX universe #1

DMX universe #2

Ref: SP485ECN-L
MAX485 CSA



EXTENSION socket

VIN	20	19	PORT1
GND	18	17	PORT2
IR_RX	16	15	PORT3
3.3V	14	13	PORT4
Relay	12	11	PORT5
DMX2+	10	9	PORT6
DMX2-	8	7	PORT7
DMX1+	6	5	PORT8
DMX1-	4	3	RS232 RX
GND_DMXX	2	1	RS232 TX

Compatible header connectors:

WURTH ELEKTRONIK ref: 61301021121
 MOLEX ref: 10-89-7202
 TE Connectivity ref: 1-87227-0
 FCI ref: 77313-101-20LF
 HARWIN ref: M20-9981046
 SAMTEC ref: TSW-110-xx-T-D
 FARNELL ref: 1841232
 RS ref: 763-6754 673-7534 251-8165
 MOUSER ref: 538-10-89-7202
 DIGIKEY ref: WM26820-ND

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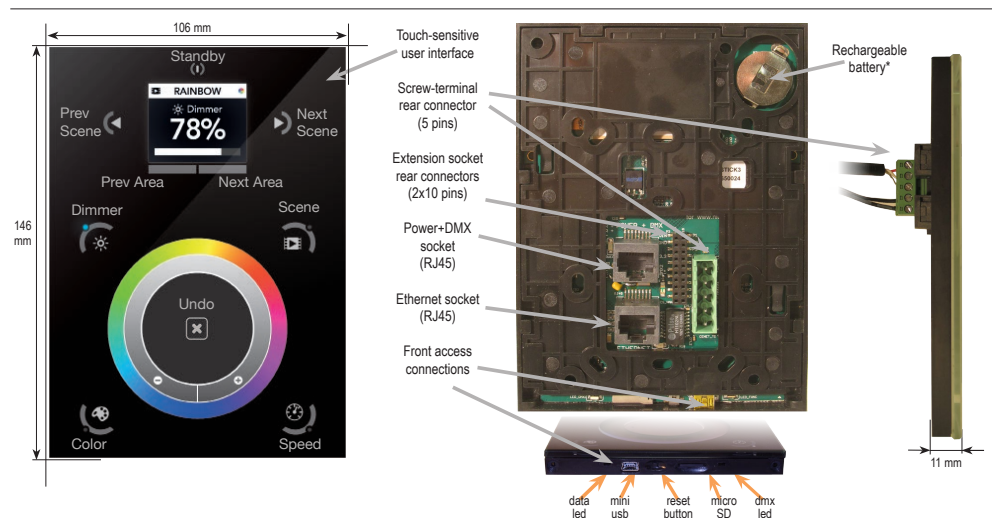
Type:

L4-Controller

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PROJECT:	TYPE:	CATALOG #:
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Connections & Triggering



Dry Contact Port Triggering

It is possible to start scenes using the input ports (contact closure). To activate a port, a brief contact of atleast 1/25 second must be established between the ports (1...8) and the ground (GND). Note: the scene will not be switched off when the switch is released.

BLACKOUT Relay (energy saving)

A relay can be connected between the RELAY and GND sockets of the 20 pin extension socket. This can be used to turn off other equipment such as lighting drivers. The signal is connected when the controller is in standby.

Example of relay :
FINDER Ref. 22.23.9.012.4000

Network Control

The controller can be connected to a local network, allowing it to be controlled from a smartphone or tablet over WIFI.

- Connect the controller to a router or switch with an RJ45 cable
- The controller is set by default to get an IP address from the router via DHCP. If the network is not working with DHCP, a manual IP address and subnet mask can be set using the Hardware Manager
- If the network has a firewall enabled, allow ports 2430 and 2431

RS232 Triggering

Make a cable using the 3 pins : TX, RX and G (GND)
Set the RS232 parameters to : 9600bds 8 bits, no Parity, 2 Stop bits

- To play a scene, send 3 bytes : 1 x y 255
- To stop a scene, send 3 bytes : 2 x y 255
- To pause a scene, send 3 bytes : 3 x y 255
- To release a pause, send 3 bytes : 4 x y 255
- To reset a scene, send 3 bytes : 5 x y 255

When (y)=0, (x) can be set between 0 and 255
-to stop scene 145, send the command: 2 145 0 255
When (y)=1, (x) can be set between 0 and 243 to trigger scenes 256-499
-to play scene 300, send the command: 1 255 45 255

Infra Red

The controller works with the official IR remote control, however there is no receiver. A 36khz infra red receiver can be connected, such as the TSOP34836 by Vishay Semiconductors. Farnell ref: 4913127. This can be attached to the 20 pin connector. It's a good idea to add a resistor and capacitor to surpress power supply disturbance.

TCP Triggering

The controller can be connected to an existing automation system over a network and triggered via TCP package on port 2431 or UDP packets on 2430. Refer to the remote protocol document for more information.



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Setting up the Controller

iPhone/iPad/Android Control

The controller can be used with one of 3 different apps. Each available at Google Play and the App store.

DMX Lightpad 3

Designed to work seamlessly with the controller, DMX Lightpad 3 provides an easy way to control your lights over a local WiFi network. Use the wheel to change the dimmer, color or speed, and the arrows to select scenes and effects just like the wall panel. Swipe down to reveal quick access scene selection buttons.

Easy Remote

Create an entirely customized remote controller for your tablet or smartphone. Easy Remote is a powerful and intuitive app allowing you to easily add buttons, faders, color wheels and more. Connect to a WiFi network and the app will find all compatible devices.

Arcolis

The Arcolis application is a comprehensive tool allowing you to directly control and re-program the controller from your smartphone or tablet. This is a simple application which can be used by just about everyone in any situation. Mobile, easy to use and powerful, Arcolis is the ideal controller for dimming or switching traditional, LED and RGB color mixing DMX lighting fixtures. Program static and dynamic lighting scenes and effects.

<http://www.nicolaudie.com/smartphone-tablet-apps.htm>

Programming the Controller

The controller be programmed from a PC, Mac, Tablet or Smartphone using the software available on our website. Refer to the corresponding software manual for more information. The firmware can be updated using the Hardware Manager which is included with the programming software.

ESA Pro Software (Windows) - Timeline + Multi-Zone

<http://www.nicolaudie.com/en/esapro.htm>

ESA2 Software (Windows/Mac) - Single Zone

<http://www.nicolaudie.com/esa2.htm>

Hardware Manager (Windows/Mac) - Firmware, clock..

<http://www.dmxsoft.com/global/ftp/hardwaremanager.zip>

<http://www.dmxsoft.com/global/ftp/HardwareManager.dmg>

Color Temperature Mixing

In addition to mixing RGB using the color pallet, it's also possible to mix up to 3 custom colors. This is useful for mixing color temperature. To set this up, choose the correct profile for your lighting fixture when programming the controller. Profiles for common channel configurations can be found in the 'Generic' folder:

RGBW for Red, Green, Blue, White
RGBA for Red, Green, Blue, Amber
RGBY for Red, Green, Blue, Yellow
WWCW for Warm White, Cold White

Once your show has been written to the controller, tap the color mode button and use the circular palette to change the color. If your lighting fixture has more than 3 color channels, tap the color mode button a second time to mix the additional colors.

Settings Menu

To access the settings menu, hold the standby button for 3 seconds.

- Use the arrow buttons or palette to scroll through the menus
- Use the area buttons to navigate forwards and backwards
- The 'undo' button can also be used to navigate forwards

Mode (M): Manages the on/off button and the 4 modes (dimmer, speed, color, scene)

Arrows (A): Allows you to adjust which modes can be controlled by the arrows

Palette (P): Allows you to adjust which modes can be controlled by the palette wheel

Scene (S): Scene management

First Start (F): Default settings when the unit is first powered up

Trigger (T): Manages the controllers external triggering properties

Ethernet (E): Enables the Ethernet socket on the controller

Date/Time (D): Manages the date and time stored inside the controller

Graphics (G): Screen management

DMX Output (X): Manage the timings of the DMX output messages and the page priorities (advanced function!)

Sensitive (S): Manage the touch sensitivity settings

Language (L): change the language of the text which appears on the screen

About: check the firmware release date and version number and assign a name for the controller



Service

Serviceable parts include:

- Memory card - used to store the scenes
- Battery - used to store the clock/calendar
- DMX Chips - used to drive the DMX (see p2.)

*To replace the Li-Ion rechargeable battery on the DE3 :

1. You need a rechargeable 3.6v LIR 2032 replacement battery
2. Remove the back panel by pulling down and sliding it out.
3. Using a paper clip push the battery from the bottom so it slides out of its cage.
4. Slide the replacement battery in from the top, making sure the positive side is facing up.
5. Replace the back panel by pushing it up into place.

PROJECT: TYPE: CATALOG #:

Internal Menu

MODE (M) : Manages the on/off button and the 4 modes (dimmer, speed, color, scene)

- M OFF enable** : enables/disables the use of the on/off button so that the controller is permanently on
- M Dimm. enable** : when enabled, scenes can be made brighter or darker
- M Color. enable** : when enabled, the color of a scene can be changed
- M Speed. enable** : when enabled, dynamic scenes can be made faster and slower
- M Scene. enable** : when enabled, the scene can be changed
- M Auto mode** : when enabled, the controller will revert to the default mode after it has been left for a specified period of time
- M Auto time** : the amount of time the controller will wait before reverting to the default mode
- M Default** : the default mode which the controller will revert to after a certain amount of time
- M Dimmer 100%** : when enabled, the dimmer mode will adjust between 0% and 100% without saturating to white between 100% and 200%
- M Lock Control** : Once this is enabled, you can hold the dimmer button for 5 seconds to enable/disable lock mode. It's automatically activated after 120 seconds. When lock is activated, you'll see a red border around the screen

Arrows (A) : Allows you to adjust which modes can be controlled by the arrows

- A Dimmer enable** : allows for the Dimmer mode to be controlled by the arrows
- A Color enable** : allows for the Color mode to be controlled by the arrows
- A Speed enable** : allows for the Speed mode to be controlled by the arrows
- A Scene enable** : allows for the Scene mode to be controlled by the arrows
- A Default** : the mode to jump to when the arrows are pressed, if the arrows are not enabled on the selected mode

Pallet (P) : Allows you to adjust which modes can be controlled by the palette wheel

- P Dimmer enable** : allows for the Dimmer mode to be controlled by the palette wheel
- P Color enable** : allows for the Color mode to be controlled by the palette wheel
- P Speed enable** : allows for the Speed mode to be controlled by the palette wheel
- P Scene enable** : allows for the Scene mode to be controlled by the palette wheel
- P Default** : the mode to jump to when the palette is pressed, if the palette is not enabled on the selected mode

Scene (S) : Scene management

- S 0(off) enable** : displays an empty off scene before scene 0 in each area
- S Pause enable** : allows a scene to be paused if the scene mode button is held for 1 second
- S Stop enable** : allows a scene to be stopped if the scene mode button is held for 4 seconds
- S Fade config** : manages the fading between scenes
 - From Show : the fade time set inside the show file will be used
 - Force : the automatic fade time set in the menu will override all fadetimes in the show file
 - Force Max : the controller will look at the show file fade time and the menu fade time and use the greatest
 - Force Min : the controller will look at the show file fade time and the menu fade time and use the smallest
 - Never : the controller will never fade between scenes
- S Fade time** : the time of the automatic fade between scenes
- S Setting management** : determines how dimmer/speed/color overrides are saved
 - SaveAlways : the dimmer/speed/color overrides all scenes until the reset button has been pressed
 - NeverSave : the dimmer/speed/color is never saved
 - AutoReset : the dimmer/speed/color is saved on the current scene
- S Trigger** : sets the scene triggering mode. Time Delay and Scene Butt allow for scenes to be scrolled through without playing
 - Auto : the scene will be triggered as soon as it's selected
 - Time Delay : a short delay is added before a scene is triggered
 - Scene Butt. : the selected scene will not play until the scene button is pressed

First Start (F) : Default settings when the unit is first powered up

- F Scene Nr.** : specify a default scene number
- F Scene Scene Recover** : activates the previously playing scene
- F Display Time** : when enabled, the time will be displayed on the screen at startup
- F Scene Nr.** : enables the triggering of a scene at startup. If disabled, no scene will be triggered

Trigger (T) : Manages the controllers external triggering properties

- T Time enable** : enables the clock triggering
- T Ports enable** : enables the 8 dry contact ports
- T RS232 enable** : enables scene triggering by RS232
- T IR enable** : enables the infra red port (disabled by default to prevent interference)
- T UDP enable** : allows the controller to send and receive UDP messages required for network control
- T Blackout port** : enables the blackout relay output which is triggered when the standby button is touched

Ethernet (E) : Manages the controllers network settings

- Ethernet** : Enables the Ethernet socket on the controller
- Dynamic IP Addr** : enables dynamic IP addressing (DHCP) which allows the controller to obtain an IP address from a router
- Sync Blackout** : when this open is enabled, all other controllers on the network will go into standby when the standby button is pressed
- Enable NTP** : enables Network Time Protocol. The controller will synchronise the clock with the internet if a connection is available
- NTP Server** : the IP address of the server to synchronize the clock. The default is 005.135.141.108
- Device's IP Add** : the controllers static IP address it will use if it does not receive an IP address via DHCP
- Mask** : the subnet mask of the controller if not set to DHCP. Generally this is 255.255.255.0
- Default Gateway** : the IP address of the router if not set to DHCP
- MAC Address** : a unique ID used to identify the controller on the network

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Date/Time (D) : Manages the date and time stored inside the controller

Date : the controllers date

Time : the controllers clock time

G Bright normal : the % brightness when the controller is not sleeping G Bright sleep: the % brightness when the controller is sleeping

G Bright LED : the % brightness of the mode and reset LEDs

Graphics (G) : Screen management

G Image enable : allows for images to be shown for each scene if they have been assigned in the programming software

G Image full : when enabled, the image will be displayed in full screen and the scene and area will not be visible

G Image time : the time it takes before the image is displayed in full screen

G Sleep enable : when enabled, the screen brightness will dim after a certain amount of time

G Sleep time : the amount of time to wait before sleeping

G Bright normal : the brightness of the screen's backlight

G Bright sleep : the brightness of the screen's backlight whilst the controller is sleeping

G Bright LED : the brightness of the scene, undo and standby LED's

DMX Output (X) : Manage the timings of the DMX output messages and the page priorities (advanced function!)

X MBB : Mark Before Break- the time to wait between sending each 512 channel DMX message (or 'packet')

X Break : Break- the time to wait just before sending a new packet, resetting the DMX line

X MAB : Mark After Break- the message which tells your receiver to begin reading data

X MBS : Mark Between Slots- the delay time between sending each DMX channels data within the DMX packet

Univ-1/Univ-2 : each timing can be set differently depending on the universe number

X Alphab Mode : if the same scene is triggered in the global area and a second area, the area with the highest letter will take priority

X LTP Mode : If the same scene is triggered in the global area and a second area, the latest scene triggered takes priority

Sensitive (S) : Manage the touch sensitivity settings

S USB Init : reset the touch sensitivity when the USB is connected and disconnected

S Auto Time : the time to wait before automatically resetting the touch sensitivity

S High Sense : when enabled, the sensitivity will be increased

S See Values : see each touch sensitive button number and palette value

Language (L) : change the language of the text which appears on the screen

About : check the firmware release date and version number and assign a name for the controller

Reset : Reset all settings to the factory default

Troubleshooting

The 4 Mode LEDs on the controller are flickering

The controller is in bootloader mode. This is a special 'startup mode' which is run before the main firmware loads.
-Check that there is nothing metallic touching the back of the controller
-Try re-writing the firmware with the latest hardware manager
-Try formatting or replacing the SD card

All LEDs on the controller are flickering except the standby LED

There is no SD card detected.
-Check the SD card is properly connected
-Try formatting the SD card in the computer
-Try re-writing the show file
-Try replacing the SD memory card

The controller is not detected by the computer

-Be sure that the latest software version is installed
-Connect by USB and open the Hardware Manager (found in the software directory). If it's detected here, try to update the firmware

All LEDs on the controller are flickering

There has been no showfile detected on the SD memory card.
-Try formatting the SD card in the computer
-Try re-writing the show file
-Try replacing the SD memory card

The lights are not responding

-Check the DMX +, - and GND are connected correctly
-Check that the driver or lighting fixture is in DMX mode
-Be sure that the DMX address has been set correctly
-Check there are no more than 32 devices in the chain
-Check that the DMX LED is flickering to the right of the SD card
-Connect with the computer and open Hardware Manager (found in the software directory). Open the DMX Input/Output tab and move the faders.
If your fixtures respond here, it is possibly a problem with the show file

HLB

Meydenbauer Center: Center Hall Remodel

250028

CONSTRUCTION DOCUMENTS

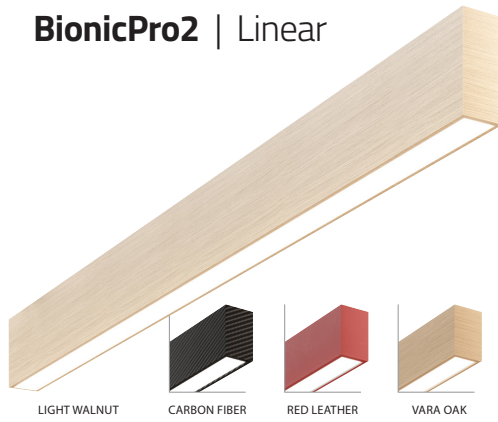
22 December 2025

Type:

L4-Controller

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BionicPro2 | Linear



LIGHT WALNUT

CARBON FIBER

RED LEATHER

VARA OAK

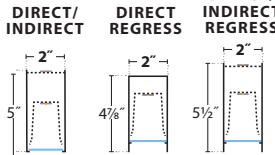
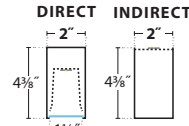
LAMINATE FINISH OPTIONS
SEE PAGE 6 FOR ALL OPTIONS

TUNABLE WHITE



PRUDENTIAL LTG.

PRULITE.COM 213.746.0360



Lumen output may vary +/- 5%
Light Loss Factor (LLF) for CCTs other than 3500K:
4000K +2%, 3000K -5%, 2700K -20%
90 CRI -15% (3K, 3500K, 4K & 5K
ADC -2% LLF
Louver LLF 30% White, 50% Silver, 70% Black

FLSH:	LO	MO	SO	HO
DIRECT:				
SAL Lm/Ft	390	575	790	1000
BTW Lm/Ft	415	610	845	1060
WWF Lm/Ft	425	625	875	1100
WWG/PFL Lm/Ft	400	600	825	1050
NGZ Lm/Ft	450	675	950	1250
MGZ Lm/Ft	425	625	875	1100
WGZ Lm/Ft	450	675	950	1250
LGP Lm/Ft	425	625	875	1100
W/Ft	3.8	5.6	7.8	10.5
INDIRECT:				
SYM Lm/Ft	600	800	1050	1350
MCW Lm/Ft	400	550	750	1000
SCW Lm/Ft	575	875	1170	1450
SACW Lm/Ft	500	750	1000	1200
W/Ft	3.8	5.6	7.8	10.5
DIRECT / INDIRECT:				
W/Ft	7.6	11.2	15.6	21

LUMEN CHART AT 3500K-80 CRI
SEE PAGE 6 FOR REGRESS



SE-RIES	LENS POS.	LED COLOR	OUT-PUT	LEN-GTH	COLOR / LAMINATE	LAM.CAN-OPY COLOR	LOUVER COLOR	DISTRIBUTION	UP OP-TIONS	CIRCU-ITING	MOUNTING	CEILING TYPE	DRIVERS	OPTIONS & SENSORS
BPRO2-LIN		-	-					-						
Bion-icPro 2 [™] Linear	FLSH Flush Lens LVR 1/2" Re-gress with Lou-ver REG.5 1/2" Re-gress IND Indirect Only (Select NW/NO Down-light)	LED27 2700K (90CRI) LED3 3000K LED35 3500K LED4 4000K LED3-90 3000K (90CRI) LED35-90 3500K (90CRI) LED4-90 4000K (90CRI) LED5-90 5000K (90CRI) PRUHUES: bios STATIC: BLU33 BLU35 BLU45 DYNAMIC: BLU3D* BLU4SD* *Dynamic BIOS, SkyBlue spike can be dimmed, CCT warns slightly TU TuHue 2700-6500K Tunable White TU2 **TuHue 2200-5000K Tunable White AMB** AmberHue Warm Dim 2200K-5000K **NA HO CHR ChromaHue RGBW (DMX at HO only)	LO Low MO Me-dium SO Stand-ard HO High PROG Pro-gram-mable Light Out-put (Specify desired lum/f or w/f) DOWN THEN UP IF FE-RE-ENT-PUT DE-SIRED	2' 3' 4' 5' 6' 7' 8' R (Row Length, 1" increments, Consult fac-tory for custom lengths) SRL Sym-metric Row Length (See page 12) NOTE: Individual fixtures are NOT intended for row mount-ing	TMW Textured Matte White (Standard) YGW Gloss White Y Premium Color CC Custom Color LUXE METAL-LICS: YBZ Bronze YCP Copper YGN Gold Nugget NOTE: All canopies painted White (TMW) unless specified otherwise. LAMINATE FINISHES (SPECIFY CAN-OPY COLOR IN NEXT COLUMN =>) LOK Vara Oak LEW Evreux Walnut LOX Oxidized Gold LOB Oxidized Black L Special Order Lami-nate (EXTENDED LEAD TIMES) NOTE: For Laminate finishes Stem is YBK Matte Black except for LOK and LLW it will be TMW White	(SKIP THIS COLUMN IF LAMINATE FINISH IS NOT SELECTED) TMW Textured Matte White (Standard) Y Premium Color CC Custom Color LUXE METAL-LICS: YBZ Bronze YCP Cop-per Penny YGN Gold Nug-get LUXE METAL-LICS: YBZ Bronze YCP Cop-per Penny YGN Gold Nug-get Y Premium Color YBK Black Matte Y Premium Color Y Premium Color CC Custom Color CC Custom Color PFL Perim-eter Room Fill NGZ Narrow Wall Graze MGZ Medium Wall Graze WGW Wide Wall Graze LGP Low Glare Prism-atic (NA HO)	SKIP COL-UMN IF LOUVER IS NOT NEEDED TMW Textured Matte White YGW Gloss White YBK Black Matte Y Premium Color CC Custom Color CC Custom Color PFL Perim-eter Room Fill NGZ Narrow Wall Graze MGZ Medium Wall Graze WGW Wide Wall Graze LGP Low Glare Prism-atic (NA HO)	CHOOSE DOWN-AND-UP DOWN: NW No Direct SAL Satin Lens BTW Batwing WWF Flat Wall Wash WWG Focal Wall Wash PFL Perim-eter Room Fill NGZ Narrow Wall Graze MGZ Medium Wall Graze WGW Wide Wall Wash LGP Low Glare Prism-atic (NA HO) UP: NU No Indirect SYM Sym-metric (Frosted ADC, Standard) MCW Medium Ceiling Wash SCW Soft Ceiling Wash SAC Soft Asym-metric Ceiling Wash	TG Top Glow ADC Acrylic Dust Cover (Clear) Standard for SYM (Frosted) TGADC Top Glow with Acrylic Dust Cover UP OP-TIONS AVAIL-ABLE WITH ANY UP-DISTRI-BUTION UNV (120-277) 347 (Emergency battery requires remote driver box)	SC Single Circuit DC Dual Circuit VOLT-AGE EMERGENCY battery requires remote driver box)	(SPECIFY CEILING TYPE IN NEXT COLUMN =>) CA48", 96" or 144" Air-craft Cable (Adjust-able LED) (Soft fade on, fade-to-black dimming) SURF Surface Mount (Direct only) RSC Rigid Stem Center SSC Swivel Stem Center (~45° of rotation) MOUNTING LOCATION IN NEXT COLUMN => WMC (Channel) 7/5" Tall Continuous Channel WMC2 (Channel) 2" Tall Continuous Channel WMU (Bracket) 5" Tall Bracket WMU1 (Bracket) 1" Tall Bracket WMU2 (Bracket) 2" Tall Bracket WM Direct to Wall WBx.x Wall Bracket (2'-6" in .5" increments, 3" standard if not specified)	CEILING TYPE: X1 T-Bar X3 Hard Ceiling X6 Slot Grid MOUNT-ING LOCA-TION: WALL (For Wall or Mullion Mount) SUR Ceiling WALL	ND Non-Dimming DMO1 0-10V, 1% Dimming (Standard) LDE1 Hi-lume 1% EcoSystem LED (Soft fade on, fade-to-black dimming) ECO 1% 0-10V, EldoLE (Logarithmic dimming std) ECDA 1% DALI, EldoLED (Logarithmic dimming std) nLight-Air Acuity nLight Drivers (ECDA driver ONLY) nLight-Wired Acuity nLight Drivers (ECO driver ONLY, Requires Remote Driver) SOLO 0.1% 0-10V, EldoLED (Dim-to-dark, Logarithmic dimming std) SODA 0.1% DALI, EldoLED (Dim-to-dark, Logarithmic dimming std) STEP Signify Advance Step Dimming 2WIRE ELY/Forward/Reverse Phase Driver PRUHUES: E10V 2 Channel Color Control EDALI 2 Channel Color Control EDMX ChromaHue or Static White	EMHE CA T20 Emergency Battery (1250 Delivered lumens; CA Title 20 compliant, consult factory for 4' or < remote) ETS-DR Iota ETS-DR Emergency Transfer Switch EMC Emergency Circuiting FTR Feather WTW Asym-metric on Perpendicular Wall (NA HO or LGP) EBCP1G/2G Single / Dual Gang Electrical Box Cover Plate/ (Mullion) COS Custom On-Center Spacing for Wall/Surface Brackets SENSORS: 205 WattStopper PIR Occupancy 205-ON/OFF 205-STEP: Dim to 50% 205-DM: Dim to 1% (NA ETS-DR) ATHENA Lutron RF (Dim-to-Off Standard) LVOC+ Lutron Vive (Occ & RF) LVRFF+ Lutron Vive (RF Only) => Requires Lutron driver NXSMP Hubbell (Occ) rES7 Daylight+(PIR Acoustic) (Occ) (nLight-Air) Part Number: rES7-PDT-1800-G2 nES7 Daylight+(PIR Acoustic) (Occ) (nLight-Wired) Part Number: nES-PDT-ADGX LUX Philips DLR CORNERS: C2-60 Lit 60° C2-90 Lit 90° C2-120 Lit 120° C2-135 Lit 135° C3T Lit 90° 3-Way: T C3T Lit 90° 3-Way: Y C4T Lit 90° 4-Way: + C4X Lit 45°-135° 4-Way: X C8I Lit Inside 2-Plane C8O Lit Outside 2-Plane 90° LOUVERS AVAILABLE (CONSULT FACTORY FOR OTHER ANGLES) LRT Linear to Recessed Transition (Straight rows only) DWNLT Downlights

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Linear

1

10-16-2025

HLB

Meydenbauer Center: Center Hall Remodel

250028

CONSTRUCTION DOCUMENTS

22 December 2025

Type:

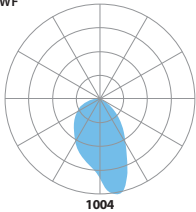
L5

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FLSH:

FLAT WALL WASH

LOW OUTPUT:
BPRO2-FLSH-LED35-LO-4-WWF
1724 Delivered Lumens
15 Watts
110 lm/w
3500 CCT

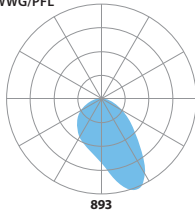


Zonal Lumen Summary:
0-90 = 100%

WALL SIDE	Vertical Angle	0°	25°	45°	65°	90°
	90°	0	0	0	0	0
	85°	16	16	19	22	24
	75°	60	62	77	82	82
	65°	121	128	160	170	159
	55°	209	222	276	315	291
	45°	334	355	427	509	455
	35°	504	528	608	714	592
	25°	709	739	836	859	694
	15°	996	1004	988	886	762
ROOM SIDE	5°	908	901	867	832	796
	0°	796	796	796	796	796
	5°	720	725	734	760	796
	15°	604	615	639	684	762
	25°	486	496	528	596	694
	35°	399	405	422	486	592
	45°	316	320	331	365	455
	55°	236	237	238	246	291
	65°	164	162	154	146	159
	75°	93	92	84	77	82
	85°	23	25	24	23	24
	90°	0	0	0	0	0
Vertical Angle		180°	202.5°	225°	247.5°	270°

FOCAL GLOW WALL WASH / PERIMETER FILL

LOW OUTPUT:
BPRO2-FLSH-LED35-LO-4-WWG/PFL
1656 Delivered Lumens
15 Watts
110 lm/w
3500 CCT



Zonal Lumen Summary:
0-90 = 100%

WALL SIDE	Vertical Angle	0°	25°	45°	65°	90°
	90°	0	0	0	0	0
	85°	17	17	21	24	26
	75°	62	67	86	90	85
	65°	132	143	189	180	147
	55°	241	261	340	314	226
	45°	394	427	532	473	328
	35°	618	660	725	604	604
	25°	870	874	826	678	525
	15°	893	871	796	694	595
ROOM SIDE	5°	722	716	689	662	632
	0°	634	634	634	634	634
	5°	565	570	578	601	632
	15°	487	491	499	529	595
	25°	436	438	441	458	525
	35°	385	384	382	387	432
	45°	329	326	318	311	328
	55°	262	259	244	225	226
	65°	186	182	164	145	147
	75°	102	102	89	81	85
	85°	24	26	25	24	26
	90°	0	0	0	0	0
Vertical Angle		180°	202.5°	225°	247.5°	270°

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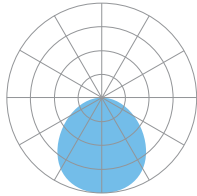
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L5



REG.5:

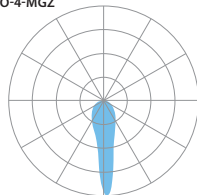
SATIN LENS

STANDARD OUTPUT:
BPRO2-LIN-REG.5-LED35-SO-SAL
 2610 Delivered Lumens
 33 Watts
 80 Lm/W
 3500 CCT



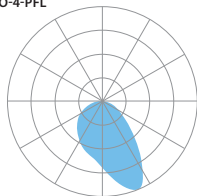
MEDIUM WALL GRAZER

STANDARD OUTPUT:
BPRO2-LIN-REG.5-LED35-SO-4-MGZ
 3210 Delivered Lumens
 31 Watts
 108 Lm/W
 3500 CCT
 19° FWHM



PERIMETER FILL

STANDARD OUTPUT:
BPRO2-LIN-REG.5-LED35-SO-4-PFL
 3029 Delivered Lumens
 33 Watts
 96 Lm/W
 3500 CCT



UPTO **108** LPW

REG.5:	LO	MO	SO	HO
SAL Lm/Ft	300	460	650	800
BTW Lm/Ft	340	500	715	900
WWF Lm/Ft	375	560	750	975
WWG/PFL Lm/Ft	375	560	750	975
MGZ Lm/Ft	400	590	800	1040
W/Ft	4	6	8	10.5

LUMEN CHART AT 3500K-80 CRI

Consult factory for Louver IES: marketing@prulite.com

LUMEN MAINTENANCE

L70 — 200,000+ Hours
L90 — 100,000+ Hours (LO, MO & SO)
L90 — 60,000+ Hours (HO)

LED SYSTEM

LED modules and drivers are field replaceable.

PROG

(OPTIONAL)

Programmable light output. Specify desired lumens or watts per linear foot.

LABELS

CSA and ETL damp labeled and I.B.E.W. manufactured.

ELECTRICAL

Must specify LED dimming controls. LED fixtures have constant current driver(s) with less than 20% THD when loaded to a minimum of 60%. Drivers sink a maximum of 6mA per driver. DM01 LED drivers are 0-10V dimmable and are compatible with most 0-10V wall slide dimmers and direct 0-10V analog signal dimmers. Max driver size 1.65" w x 1.25" h.

CONSTRUCTION

Housing Extruded aluminum housing and side wall >25% PC recycled, 100% recyclable.

Lens Seamless lens up to 200'. Consult factory for longer lengths. Polymer, 100% recyclable.

Weight 3.5 lbs/ft

MOUNTING

Surface mounted to walls or ceilings, wall spacer, wall bracket to wall, suspended by cable.

WARRANTY

Single-source, 5 year limited warranty covers standard components and construction.

FINISH COLORS

STANDARD:

TMW — Textured Matte White

YGW — Gloss White

PREMIUM:

YSW — Seashell White (Matte)

YPE — Powder (Matte)

YRG — Rain Grey (Gloss)

YIB — Interstate Blue (Matte)

YBR — Bronze (Matte)

YSRM — Sunset Red (Matte)

YSTM — Storm Grey (Matte)

YBK — Black (Matte)

YBB — Black (Semi Gloss)

YOR — Orange (Matte)

YSAM — Sapphire (Matte)

YFGM — Forest Green (Matte)

YSKM — Sky (Matte)

YMB — Military Blue (Matte)

YSAM — Sapphire (Matte)

YSL — Silver (Metallic)

YCH — Champagne (Metallic)

LUXE METALLICS:

YCP — Copper Penny (Metallic)

YBZ — Bronze (Metallic)

YGN — Gold Nugget (Metallic)

YOR — Orange (Matte)

YBR — Bronze (Matte)

YSRM — Sunset Red (Matte)

YOR — Orange (Matte)

YSAM — Sapphire (Matte)

YFGM — Forest Green (Matte)

YSL — Silver (Metallic)

YCH — Champagne (Metallic)

LAMINATE FINISHES:

Choose from one of our Premium Colors with no set-up fee. For paint chip samples, please email: info@prulite.com

STANDARD:

LOK — Vana Oak

LEW — Evreux Walnut

LOG — Oxidized Gold

LOB — Oxidized Black

SPECIAL ORDER (EXTENDED LEAD TIMES):

LKK — Dark Oak

LMD — Medium Walnut

LLW — Light Walnut

LCP — Oxidized Copper

LCF — Carbon Fiber

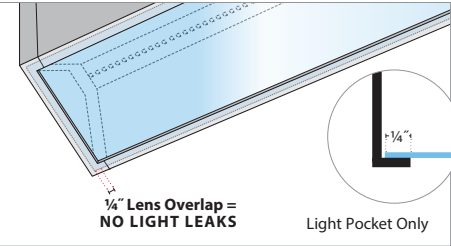
LRL — Red Leather

LGR — Grey Suede

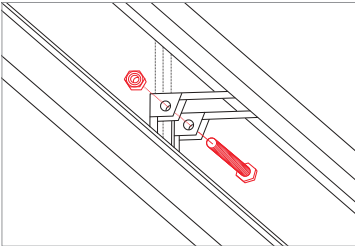
NOTE: For Laminate finishes Stem is YBK Matte Black except for LOK and LLW it will be TMW White.



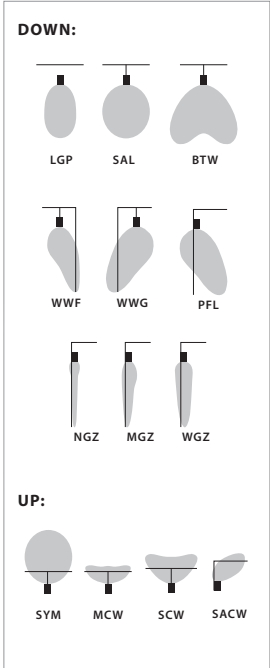
CAST ALUMINUM END CAPS



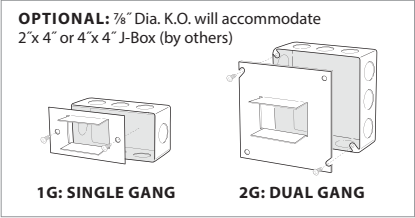
ADJOINING DETAILS



DISTRIBUTIONS



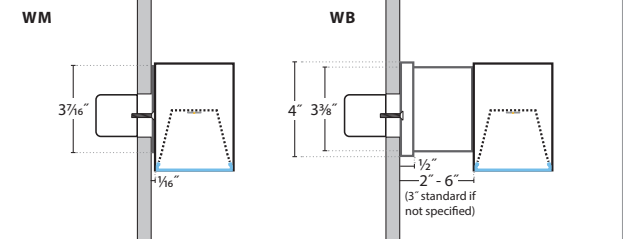
EBCP — ELECTRICAL BOX COVER PLATE



CANOPY DETAIL



WALL CROSS SECTIONS



FIXTURE SIZE VARIES

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CONSTRUCTION DOCUMENTS
22 December 2025

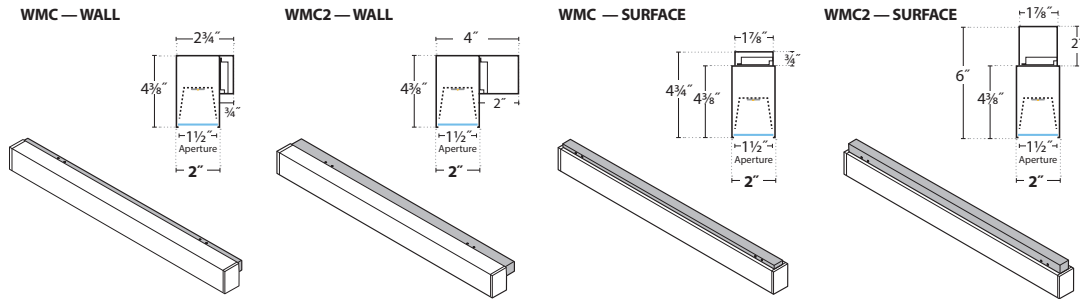
Type:
L5



Why Channels?

Channels provide maximum flexibility in mounting points on the ceiling/wall (drilled in the field into structure).

2 mounting points per channel required, all channels are the length of the fixture. .75" Channel accommodates SOOW cord (8 foot, 6 conductor cord), 2" Channel accommodates Iquittite Flex with sealed connectors (6' long 6' conductor cord).

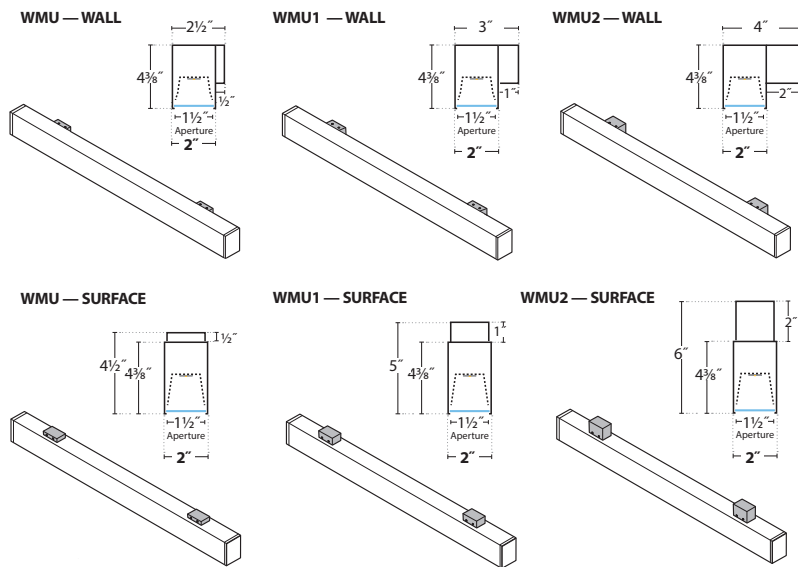


Why Brackets?

Clean look. Two options.

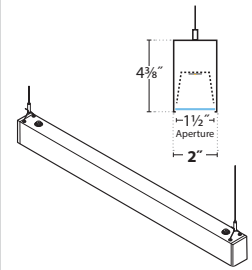
1. Installed at our standard dimensions (see page 5).

2. COS (Custom on-center spacing) — Provide dimensions and our factory will install bracket cleats at provided dimensions.

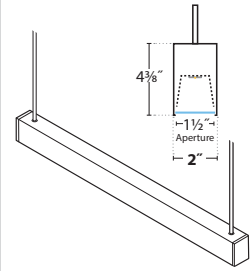


See page 5 for mounting dimensions.

CA — CABLE MOUNT



R/SSC — STEM MOUNT



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Linear

8

10-16-2025

HLB

Meydenbauer Center: Center Hall Remodel

250028

CONSTRUCTION DOCUMENTS

22 December 2025

Type:

L5

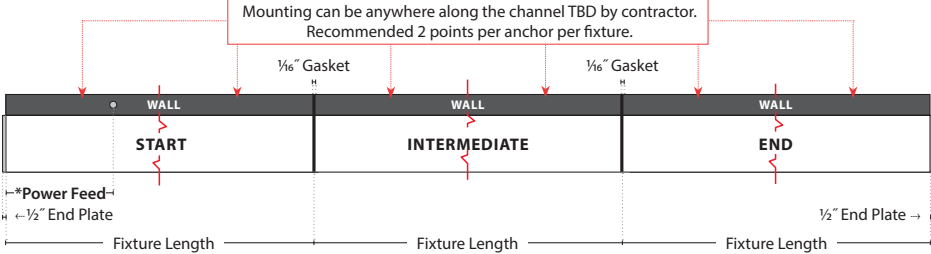
Page 38 of 49

WMC/WMC2 (CHANNELS): WALL — MOUNTING

NOTE: 2' ROW FIXTURES NOT AVAILABLE

POWER FEED

Mounting can be anywhere along the channel TBD by contractor. Recommended 2 points per anchor per fixture.



1/2" Gasket

1/2" Gasket

WALL

START

INTERMEDIATE

END

1/2" End Plate

1/2" End Plate

Fixture Length

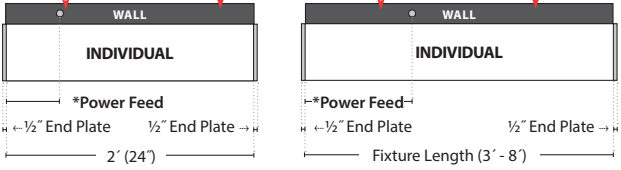
Fixture Length

Fixture Length

INDIVIDUAL (2'):

Mounting can be anywhere along the channel TBD by contractor. Recommended 2 points per anchor per fixture.

Mounting can be anywhere along the channel TBD by contractor. Recommended 2 points per anchor per fixture.



WALL

INDIVIDUAL

INDIVIDUAL

WALL

1/2" End Plate

1/2" End Plate

1/2" End Plate

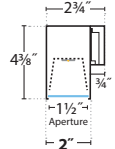
1/2" End Plate

2' (24")

Fixture Length (3' - 8')

	*Power Feed	FIXTURE LENGTHS
2'	4"	24"
3'	10"	36"
4'	10"	48"
5'	10"	60"
6'	36"	72"
7'	42"	84"
8'	48"	96"

WMC — WALL



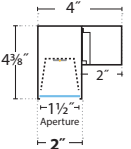
2 3/4"

4 3/8"

1 1/2" Aperture

2"

WMC2 — WALL



4"

4 3/8"

2" Aperture

2"



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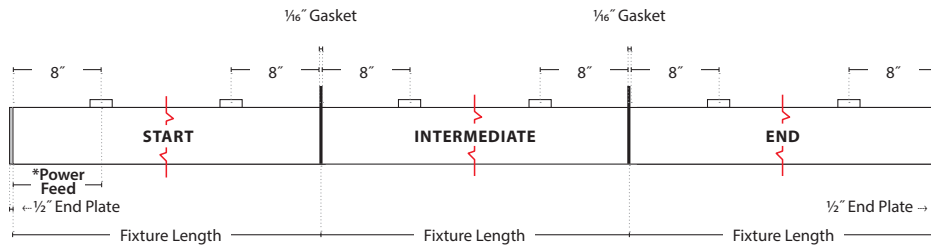
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CONSTRUCTION DOCUMENTS
22 December 2025

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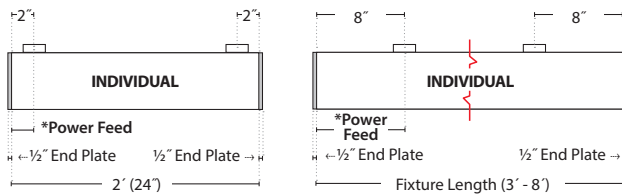


WMU/WMU1/WMU2 (BRACKETS): WALL — MOUNTING

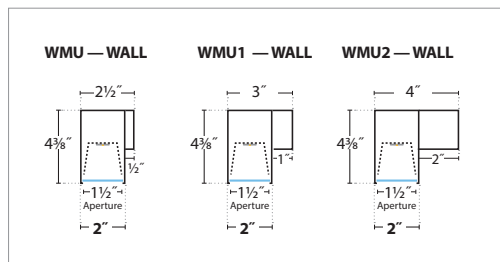
NOTE: 2' ROW FIXTURES NOT AVAILABLE



INDIVIDUAL (2'):



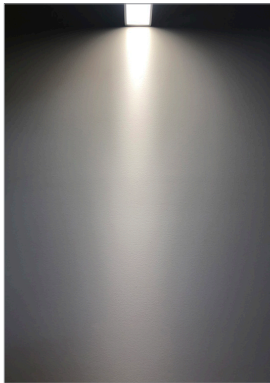
		FIXTURE LENGTHS	MOUNTING LOCATIONS		
	*Power Feed	All	Start / Intermediate / End	Individual	COS (Custom On-Center Spacing)
2'	2"	24"	—	20"	Customer to provide on-center mounting dimensions, PRU will pre-drill and mount Brackets
3'	8"	36"	20"	20"	
4'	8"	48"	32"	32"	
5'	8"	60"	44"	44"	
6'	8"	72"	56"	56"	
7'	8"	84"	68"	68"	
8'	8"	96"	80"	80"	



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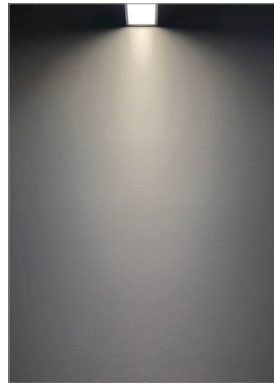


FTR END OF ROW FEATHERING



Wall to wall (WTW) fixtures can project strong lighting distributions on perpendicular wall which some find undesirable.

Medium Wall Graze (MGZ) shown above.



Feather (FTR) softens distributions on perpendicular walls.

Medium Wall Graze (MGZ) shown above with FTR.

LGP LOW GLARE PRISMATIC LENS



TOP VIEW

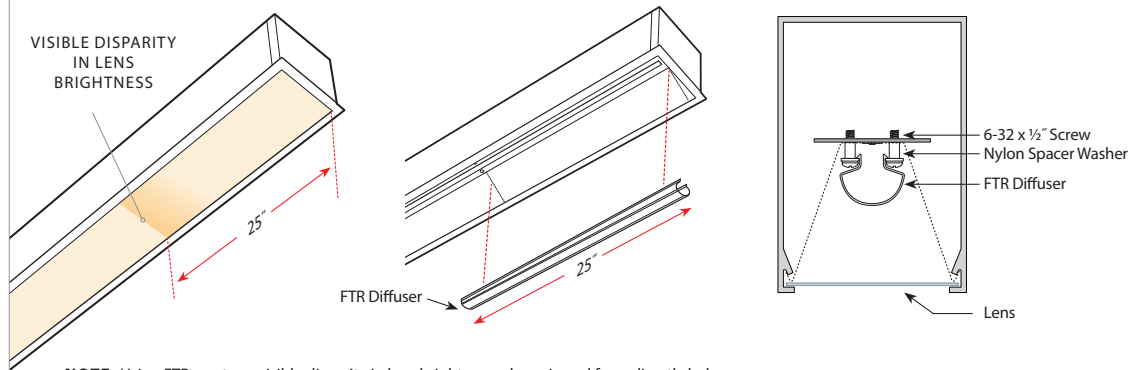


WELL OPTION 1B,
FIXTURE UGR 16 OR LESS

Low Glare Prismatic lens has a dynamic 'prismatic stripe' that 'follows the viewer' and offers a sense of depth. The narrow distribution has low glare (UGR) and meets WELL UGR of 16 or lower. It utilizes the FTR Diffuser (see below).

NOTE: Our Batwing lens also meets WELL UGR of 16 or less (BioPro 3-4-5). NA with HO output.

FTR (FEATHERING DIFFUSER) DETAIL



NOTE: Using FTR creates a visible disparity in lens brightness when viewed from directly below. FTR is NOT available dual-sided on two corners 5' or less.

ROW BUILDER

18' STANDARD ROW LENGTH:

8'

6'

4'

18' SYMMETRIC ROW LENGTH (SRL):

6'

6'

6'

STANDARD

ROW LENGTH		
9'	5+4	5FT STR + 4FT END
10'	6+4	6FT STR + 4FT END
11'	7+4	7FT STR + 4FT END
12'	8+4	8FT STR + 4FT END
13'	8+5	8FT STR + 5FT END
14'	8+6	8FT STR + 6FT END
15'	8+7	8FT STR + 7FT END
16'	8+8	8FT STR + 8FT END
17'	8+5+4	8FT STR + 5FT INT + 4FT END
18'	8+6+4	8FT STR + 6FT INT + 4FT END
19'	8+7+4	8FT STR + 7FT INT + 4FT END
20'	8+8+4	8FT STR + 8FT INT + 4FT END
21'	8+8+5	8FT STR + 8FT INT + 5FT END
22'	8+8+6	8FT STR + 8FT INT + 6FT END
23'	8+8+7	8FT STR + 8FT INT + 7FT END
24'	8+8+8	8FT STR + 8FT INT + 8FT END
25'	8+8+5+4	8FT STR + 8FT INT + 5FT INT + 4FT END
26'	8+8+6+4	8FT STR + 8FT INT + 6FT INT + 4FT END
27'	8+8+7+4	8FT STR + 8FT INT + 7FT INT + 4FT END
28'	8+8+8+4	8FT STR + (2) 8FT INT + 4FT END
29'	8+8+8+5	8FT STR + (2) 8FT INT + 5FT END
30'	8+8+8+6	8FT STR + (2) 8FT INT + 6FT END
31'	8+8+8+7	8FT STR + (2) 8FT INT + 7FT END
32'	8+8+8+8	8FT STR + (2) 8FT INT + 8FT END
33'	8+8+8+5+4	8FT STR + (2) 8FT INT + 5FT INT + 4FT END
34'	8+8+8+6+4	8FT STR + (2) 8FT INT + 6FT INT + 4FT END
35'	8+8+8+7+4	8FT STR + (2) 8FT INT + 7FT INT + 4FT END
36'	8+8+8+8+4	8FT STR + (3) 8FT INT + 4FT END
37'	8+8+8+8+5	8FT STR + (3) 8FT INT + 5FT END
38'	8+8+8+8+6	8FT STR + (3) 8FT INT + 6FT END
39'	8+8+8+8+7	8FT STR + (3) 8FT INT + 7FT END
40'	8+8+8+8+8	8FT STR + (3) 8FT INT + 8FT END
41'	8+8+8+8+5+4	8FT STR + (3) 8FT INT + 5FT INT + 4FT END
42'	8+8+8+8+6+4	8FT STR + (3) 8FT INT + 6FT INT + 4FT END
43'	8+8+8+8+7+4	8FT STR + (3) 8FT INT + 7FT INT + 4FT END
44'	8+8+8+8+8+4	8FT STR + (4) 8FT INT + 4FT END
45'	8+8+8+8+8+5	8FT STR + (4) 8FT INT + 5FT END
46'	8+8+8+8+8+6	8FT STR + (4) 8FT INT + 6FT END
47'	8+8+8+8+8+7	8FT STR + (4) 8FT INT + 7FT END
48'	8+8+8+8+8+8	8FT STR + (4) 8FT INT + 8FT END
49'	8+8+8+8+8+5+4	8FT STR + (4) 8FT INT + 5FT INT + 4FT END
50'	8+8+8+8+8+6+4	8FT STR + (4) 8FT INT + 6FT INT + 4FT END

SYMMETRICAL

ROW LENGTH		
9'	3+3+3	3FT STR + 3FT INT + 3FT END
10'	5+5	5FT STR + 5FT END
11'	4+3+4	4FT STR + 3FT INT + 4FT END
12'	6+6	6FT STR + 6FT END
13'	4+5+4	4FT STR + 5FT INT + 4FT END
14'	7+7	7FT STR + 7FT END
15'	5+5+5	5FT STR + 5FT INT + 5FT END
16'	8+8	8FT STR + 8FT END
17'	6+5+6	6FT STR + 5FT INT + 6FT END
18'	6+6+6	6FT STR + 6FT INT + 6FT END
19'	6+7+6	6FT STR + 7FT INT + 6FT END
20'	8+4+8	8FT STR + 4FT INT + 8FT END
21'	8+5+8	8FT STR + 5FT INT + 8FT END
22'	8+6+8	8FT STR + 6FT INT + 8FT END
23'	8+7+8	8FT STR + 7FT INT + 8FT END
24'	8+8+8	8FT STR + 8FT INT + 8FT END
25'	6+4+5+4+6	6FT STR + 4FT INT + 5FT INT + 4FT INT + 6FT END
26'	8+5+5+8	8FT STR + (2) 5FT INT + 8FT END
27'	6+5+5+5+6	6FT STR + (3) 5FT INT + 6FT END
28'	8+6+6+8	8FT STR + (2) 6FT INT + 8FT END
29'	8+4+5+4+8	8FT STR + 4FT INT + 5FT INT + 4FT INT + 8FT END
30'	8+7+7+8	8FT STR + (2) 7FT INT + 8FT END
31'	8+5+5+5+8	8FT STR + (3) 5FT INT + 8FT END
32'	8+8+8+8	8FT STR + (2) 8FT INT + 8FT END
33'	8+6+5+6+8	8FT STR + 6FT INT + 5FT INT + 6FT INT + 8FT END
34'	8+6+6+6+8	8FT STR + 6FT INT + 6FT INT + 6FT INT + 8FT END
35'	8+6+7+6+8	8FT STR + 6FT INT + 7FT INT + 6FT INT + 8FT END
36'	8+8+4+8+8	8FT STR + 8FT INT + 4FT INT + 8FT INT + 8FT END
37'	8+8+5+8+8	8FT STR + 8FT INT + 5FT INT + 8FT INT + 8FT END
38'	8+8+6+8+8	8FT STR + 8FT INT + 6FT INT + 8FT INT + 8FT END
39'	8+8+7+8+8	8FT STR + 8FT INT + 7FT INT + 8FT INT + 8FT END
40'	8+8+8+8+8	8FT STR + (3) 8FT INT + 8FT END
41'	8+6+4+5+4+6+8	8FT STR + 6FT INT + 4FT INT + 5FT INT + 4FT INT + 6FT INT + 8FT END
42'	8+8+5+5+8+8	8FT STR + 8FT INT + (2) 5FT INT + 8FT INT + 8FT END
43'	8+6+5+5+5+6+8	8FT STR + 6FT INT + (3) 5FT INT + 6FT INT + 8FT END
44'	8+8+6+6+8+8	8FT STR + 8FT INT + (2) 6FT INT + 8FT INT + 8FT END
45'	8+8+4+5+4+8+8	8FT STR + 8FT INT + 4FT INT + 5FT INT + 4FT INT + 8FT INT + 8FT END
46'	8+8+7+7+8+8	8FT STR + 8FT INT + (2) 7FT INT + 8FT INT + 8FT END
47'	8+8+5+5+5+8+8	8FT STR + 8FT INT + (3) 5FT INT + 8FT INT + 8FT END
48'	8+8+8+8+8+8	8FT STR + (4) 8FT INT + 8FT END
49'	8+8+6+5+6+8+8	8FT STR + 8FT INT + 6FT INT + 5FT INT + 6FT INT + 8FT INT + 8FT END
50'	8+8+6+6+6+8+8	8FT STR + 8FT INT + (3) 6FT INT + 8FT INT + 8FT END

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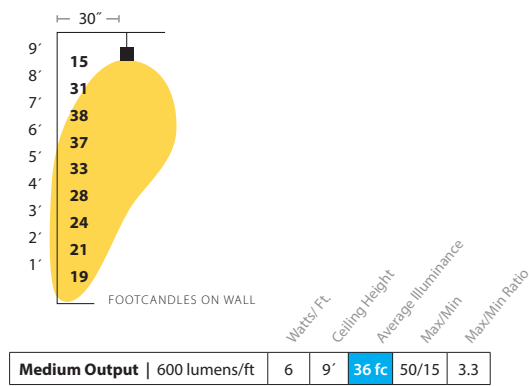
Meydenbauer Center: Center Hall Remodel

250028
CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L5

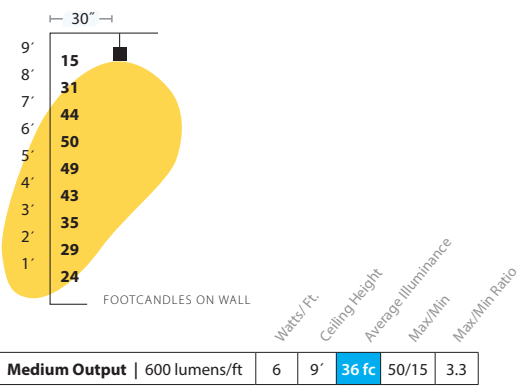
Smooth, flat wall washing (WWF)

Our patent-pending TruBeam™ optics redirect light in an ideal flat wall wash for smooth, even illumination.



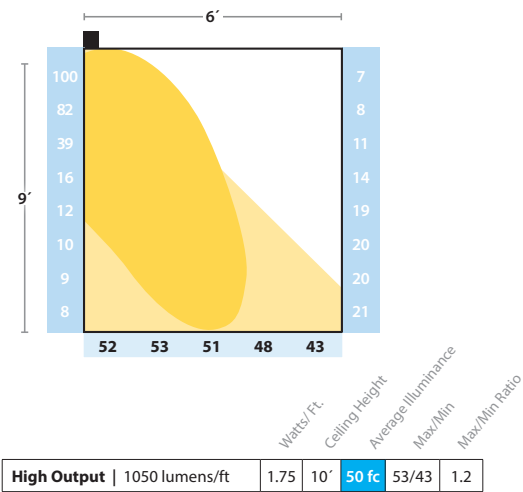
Focal glow wall washing (WWG)

Pique interest by giving works of art 'pop' — more light at eye level



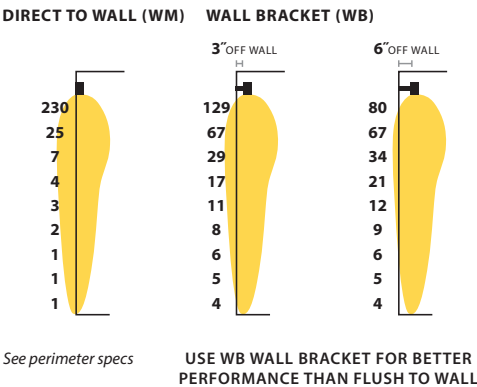
Perimeter Fill (PFL)

Wash a corridor in light from one side of the perimeter. Our Perimeter Fill is ideal for hospital corridors where a 50 fc average is needed.



Medium Wall Graze (MGZ)

Wall grazing performance often better just off a wall.



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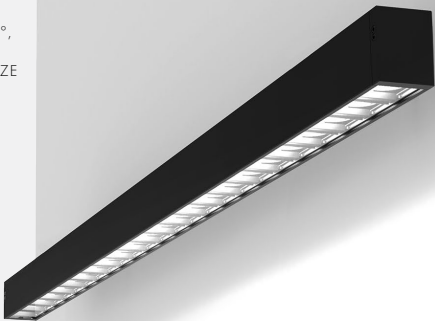
250028
CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L5

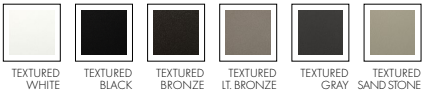
PROJECT: TYPE: CATALOG #: MI - - - - - - - - - -

PROFILE

LIGHT SOURCE 3.5 W/FT, 9.0 W/FT, 15.0 W/FT
OPTICAL DISTRIBUTIONS 7° X 60°, 10° X 10°, 10° X 60°, 10° X 90°, 20° X 20°, 20° X 60°, 40° X 40°, 40° X 60°, 40° X 90°, 60° X 60°, 90° X 90° 80° X 80°, ASYMMETRIC GRAZE
CCT 22K, 27K, 30K, 35K, 40K, RED, GREEN, BLUE, AMBER
CRI 80+ (HCRI, 90+ OPTION)
PERFORMANCE UP TO 117530 PEAK CANDELA
VOLTAGE 120V OR 277V
POWER INTEGRAL POWER SUPPLY
CONTROL 0-10V, DMX, LUTRON HI-LUME
LENGTHS 12", 24", 36", 48", 60", 72", 84", 96"
WEIGHT 2.75 LB (1.25 KG) PER FOOT
HOUSING PRECISION EXTRUDED ALUMINUM
LENS HIGH DENSITY ACRYLIC LENS
FINISH HIGH DURABILITY POWDER COATING
OPERATING TEMP -20° C TO 40° C
WARRANTY 5-YEAR LIMITED
CERTIFICATION ETL AND CETL FOR DRY OR DAMP LOCATION

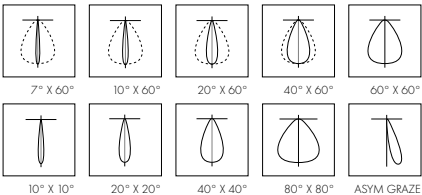


STANDARD FINISHES



OPTICAL DISTRIBUTIONS

Not all available optics shown



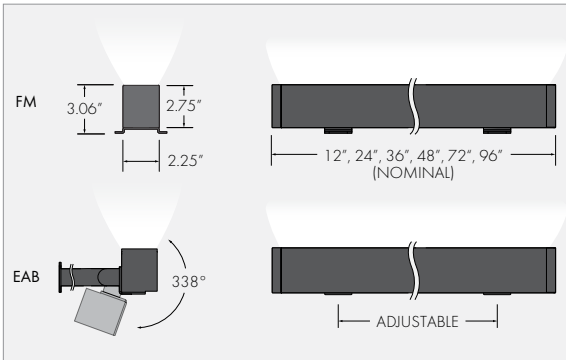
PERFORMANCE SAMPLE

[Go to Performance Data >](#)

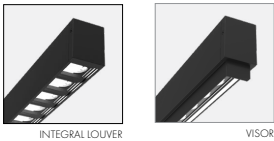
40K, HO, 48.00"	10° X 10°	10° X 60°	20° X 20°	80° X 80°	100°
LUMENS	6316	5417	6475	6161	6459
CANDELA	117530	19943	52385	3960	2739
EFFICACY	91.2 LM/W	77.3 LM/W	93.3 LM/W	88.8 LM/W	94.4 LM/W

PROFILE

Not all available mountings shown



OPTIONS



Revised July 16, 2025
Specifications subject to change without notice



Meydenbauer Center: Center Hall Remodel

250028
CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L6

PROJECT: TYPE: CATALOG #: MI - - - - - - - - - -

SPECIFICATION

MI

1234567891011

1

FIXTURE

STRUCTURE GRAZE

MI

2

WATTAGE

LOW OUTPUT

LO

3.5 W/FT

MEDIUM OUTPUT

MO

9.0 W/FT

HIGH OUTPUT

HO

15.0 W/FT

3

CCT

2200K

2200K

2700K

2700K

3000K

3000K

3500K

3500K

4000K

4000K

RED

REDST

GREEN

GRNST

BLUE

BLUST

AMBER

AMBST

4

OPTICAL DISTRIBUTION

7° X 60°

0760

10° X 10°

1010

10° X 60°

1060

10° X 90°

1090

20° X 20°

2020

20° X 60°

2060

20° X 90°

2090

40° X 40°

4040

40° X 60°

4060

40° X 90°

4090

60° X 60°

6060

60° X 90°

6090

80° X 80°

8080

100° X 100°

9090

ASYM GRAZE UPLIGHT, LEFT POWER FEED ¹

ASUL

ASYM GRAZE UPLIGHT, RIGHT POWER FEED ¹

ASUR

ASYM GRAZE DOWNLIGHT, LEFT POWER FEED ¹

ASDL

ASYM GRAZE DOWNLIGHT, RIGHT POWER FEED ¹

ASDR

DIRECT VIEW FLAT WHITE LENS

WL

WL option is only available with Medium Output

WL option has a LLF of 30%

¹ Asym Graze: See page 3 for details.

5

MOUNTING

FIXED MOUNT

FM

Available as a single fixture only

HINGE MOUNT

HM

SURFACE MOUNT, BACK

SMB

EXTENDED ARM, BACK

EAB-X

AIRCRAFT CABLE ¹

AM-X

PENDANT ¹

PM-X

¹ Aircraft cable and pendant mount are available as downlight only

6

FIXTURE LENGTH

12"

12

24"

24

36"

36

48"

48

60"

60

72"

72

84"

84

96"

96

CONTINUOUS RUN

X

Specify run length in twelve inch increments

Continuous Run (CR) option must be included.

See page 11 for typical continuous run layouts and maximum number of fixtures per power feed.

7

VOLTAGE

120VAC

120

277VAC

277

Contact factory for additional voltages

8

CONTROL OPTIONS

0-10V DIMMING (1%)

DIM

LUTRON HI-LUME 1% E.S.

L3DA

Not available with 12" and 24" fixtures

Not available with 48" fixtures in High Output.

Dimming control system to be supplied by others.

DMX DIMMING ³

DMX

² Fixtures are shipped w/ default set at address 1

² Fixtures are not pre-addressed or labeled at the factory. A DMXCAT Tool is required for on-site fixture resolution/addressing. See below.

³ A CDS/RDM Distribution Kit is required. Must be ordered separately. See below.

² DMX controls are required. Order separately.

9

FIXTURE FINISH

TEXTURED WHITE

TWH

TEXTURED BLACK

TBL

TEXTURED BRONZE

TBR

TEXTURED LIGHT BRONZE

TLB

TEXTURED GRAY

TGR

TEXTURED NATURAL

TNA

TEXTURED SANDSTONE

TSA

CUSTOM COLOR

CUS

Contact factory for custom color. Additional charges will apply.

10

CANOPY FINISH

TEXTURED WHITE

TWH

TEXTURED BLACK

TBL

TEXTURED BRONZE

TBR

TEXTURED LIGHT BRONZE

TLB

TEXTURED GRAY

TGR

TEXTURED NATURAL

TNA

TEXTURED SANDSTONE

TSA

CUSTOM COLOR

CUS

Contact factory for custom color. Additional charges will apply.

11

OPTIONS

CONTINUOUS RUN

CR

See page 11 for typical continuous run layouts and maximum number of fixtures per power feed.

HIGH CRI 90+

HIC

Available with 27K and 30K

INTEGRAL LOUVER

ILV

Integral low profile louver

20% light loss factor with louver

Finish to match fixture housing

Not available with Asymmetric distribution

Integral louver cannot be combined with Visor

VISOR

VS

Visor comes installed on fixture and the orientation can be adjusted during installation

Visor cannot be combined with Integral Louver

Visor finish to match fixture housing

DMX TOOLS FOR DMX DIMMING

<div>1</div> <div>DMX/RDM DISTRIBUTION KIT</div> <div>PART NUMBER</div> <div>CDS-RDM - DMX/RDM DISTRIBUTION KIT - IP67</div> <div>SA27411</div> <div>Consists of 4 output</div> <div>Each output is limited to (1) run per output - up to 32 fixtures max</div>	<div>1</div> <div>REMOTE DMX/RDM MONITORING TOOL</div> <div>PART NUMBER</div> <div>DMX/RDM ADDRESSING & MONITORING TOOL</div> <div>SA27636</div> <div>Uses Bluetooth LE technology for communication with the smartphone and the DMXcat app (up to a 50' range). Allows for on-site fixture resolution and addressing.</div>
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Meydenbauer Center: Center Hall Remodel

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CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L6

PROJECT: TYPE: CATALOG #: MI - - - - - - - - -

PERFORMANCE

CCT AND LENGTH	OPTIC	LOW OUTPUT (3.5 W/FT)			MEDIUM OUTPUT (9.0 W/FT)			HIGH OUTPUT (15.0 W/FT)		
		DELIVERED LUMENS	LUMINAIRE EFFICACY	PEAK CANDELA	DELIVERED LUMENS	LUMINAIRE EFFICACY	PEAK CANDELA	DELIVERED LUMENS	LUMINAIRE EFFICACY	PEAK CANDELA
4000K 24.00"	7° X 60°	998 LM	1070 LM/W	3662	1,685 LM	110.0 LM/W	6,189	3,366 LM	98.0 LM/W	12,363
	10° X 10°	932 LM	100.5 LM/W	17011	1,566 LM	103.0 LM/W	28,686	3,158 LM	91.2 LM/W	58,765
	10° X 60°	804 LM	86.6 LM/W	2905	1,348 LM	88.4 LM/W	4871	2,709 LM	77.3 LM/W	9,972
	20° X 20°	948 LM	102.1 LM/W	7658	1,601 LM	102.4 LM/W	12,983	3,238 LM	93.3 LM/W	26,193
	20° X 60°	862 LM	92.8 LM/W	1893	1,451 LM	96.2 LM/W	3,207	2,914 LM	84.6 LM/W	6,379
	40° X 40°	1001 LM	108.0 LM/W	1395	1,688 LM	111.0 LM/W	2,338	3,392 LM	98.8 LM/W	4,733
	40° X 60°	896 LM	96.7 LM/W	724	1,497 LM	98.6 LM/W	1,211	3,039 LM	88.1 LM/W	2,470
	60° X 60°	993 LM	107.1 LM/W	882	1,666 LM	109.3 LM/W	1,485	3,354 LM	97.7 LM/W	2,999
	80° X 80°	912 LM	98.2 LM/W	585	1,525 LM	100.1 LM/W	976	3,081 LM	88.8 LM/W	1,980
	100° X 100°	620 LM	86.8 LM/W	263	1,964 LM	93.3 LM/W	829	3,230 LM	94.4 LM/W	1,370
	ASY	888 LM	96.3 LM/W	3134	1,473 LM	97.8 LM/W	5,199	2,890 LM	88.2 LM/W	9,369
4000K 36.00"	7° X 60°	1,496 LM	1070 LM/W	5,492	2,527 LM	110.0 LM/W	9,283	5,048 LM	98.0 LM/W	18,544
	10° X 10°	1,398 LM	100.5 LM/W	25,516	2,349 LM	103.0 LM/W	43,029	4,737 LM	91.2 LM/W	88,148
	10° X 60°	1,205 LM	86.6 LM/W	4,357	2,022 LM	88.4 LM/W	7,306	4,063 LM	77.3 LM/W	14,957
	20° X 20°	1,421 LM	102.1 LM/W	11,486	2,402 LM	102.4 LM/W	19,474	4,856 LM	93.3 LM/W	39,289
	20° X 60°	1,292 LM	92.8 LM/W	2,840	2,177 LM	96.2 LM/W	4,810	4,371 LM	84.6 LM/W	9,569
	40° X 40°	1,502 LM	108.0 LM/W	2,093	2,531 LM	111.0 LM/W	3,506	5,088 LM	98.8 LM/W	7,100
	40° X 60°	1,344 LM	96.7 LM/W	1,086	2,245 LM	98.6 LM/W	1,817	4,559 LM	88.1 LM/W	3,704
	60° X 60°	1,489 LM	107.1 LM/W	1,322	2,499 LM	109.3 LM/W	2,228	5,031 LM	97.7 LM/W	4,499
	80° X 80°	1,368 LM	98.2 LM/W	877	2,287 LM	100.1 LM/W	1,464	4,621 LM	88.8 LM/W	2,970
	100° X 100°	929 LM	86.8 LM/W	394	2,946 LM	93.3 LM/W	1,244	4,844 LM	94.4 LM/W	2,054
	ASY	1,332 LM	96.3 LM/W	4,700	2,209 LM	97.8 LM/W	7,798	4,335 LM	88.2 LM/W	14,053
4000K 48.00"	7° X 60°	1,995 LM	1070 LM/W	7,323	3,369 LM	110.0 LM/W	12,377	6,731 LM	98.0 LM/W	24,725
	10° X 10°	1,864 LM	100.5 LM/W	34,021	3,132 LM	103.0 LM/W	57,372	6,316 LM	91.2 LM/W	117,530
	10° X 60°	1,607 LM	86.6 LM/W	5,809	2,696 LM	88.4 LM/W	9,741	5,417 LM	77.3 LM/W	19,943
	20° X 20°	1,895 LM	102.1 LM/W	1,5315	3,202 LM	102.4 LM/W	25,965	6,475 LM	93.3 LM/W	52,385
	20° X 60°	1,723 LM	92.8 LM/W	3,786	2,902 LM	96.2 LM/W	6,413	5,828 LM	84.6 LM/W	12,758
	40° X 40°	2,002 LM	108.0 LM/W	2,790	3,375 LM	110.7 LM/W	4,675	6,784 LM	98.8 LM/W	9,466
	40° X 60°	1,792 LM	96.7 LM/W	1,448	2,993 LM	98.6 LM/W	2,422	6,078 LM	88.1 LM/W	4,939
	60° X 60°	1,985 LM	107.1 LM/W	1,763	3,332 LM	109.3 LM/W	2,970	6,708 LM	97.7 LM/W	5,998
	80° X 80°	1,824 LM	98.2 LM/W	1,169	3,049 LM	100.1 LM/W	1,952	6,161 LM	88.8 LM/W	3,960
	100° X 100°	1,239 LM	86.8 LM/W	525	3,928 LM	93.3 LM/W	1,658	6,459 LM	94.4 LM/W	2,739
	ASYM. GRAZE	1,776 LM	96.3 LM/W	6,267	2,945 LM	97.8 LM/W	10397	5,780 LM	88.2 LM/W	18,787

THE ABOVE DATA IS FOR 0-10V DIMMING. MULTIPLY THE 0-10V DATA BY 0.80 (LLF) FOR DMX DIMMING ON ALL WHITE LIGHT.

ALL INSIGHT WHITE LIGHT IES FILES ARE CALCULATED WITH 4000K. FOR ESTIMATIONS OF ADDITIONAL CCTS, PLEASE USE THE FOLLOWING MULTIPLIERS:

	2700K MULTIPLIER	3000K MULTIPLIER	3500K MULTIPLIER
LUMEN MULTIPLIERS	0.87	0.90	0.95
MULTIPLY THE 4000K LUMEN DATA BY THE ABOVE MULTIPLIERS			



Meydenbauer Center: Center Hall Remodel

250028
CONSTRUCTION DOCUMENTS
22 December 2025

Type:
L6

PROJECT:

TYPE:

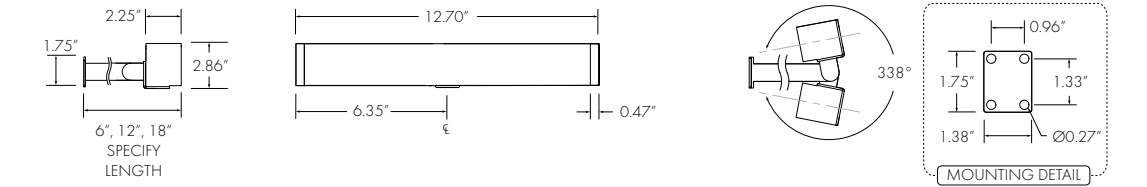
CATALOG #: MI - - - - - - - - - -

DIMENSIONS

	12" FIXTURE	24" FIXTURE	36" FIXTURE	48" FIXTURE	60" FIXTURE	72" FIXTURE	84" FIXTURE	96" FIXTURE
DIM A	See EAB 12" below	24.44"	36.19"	47.94"	59.69"	71.44"	83.19"	94.94"
DIM B	See EAB 12" below	12.00" TO 22.00"	12.00" TO 33.00"	12.00" TO 45.00"	12.00" TO 57.00"	12.00" TO 68.00"	12.00" TO 79.00"	12.00" TO 92.00"
DIM C	See EAB 12" below	23.50"	35.25"	47.00"	58.50"	70.50"	82.00"	94.00"

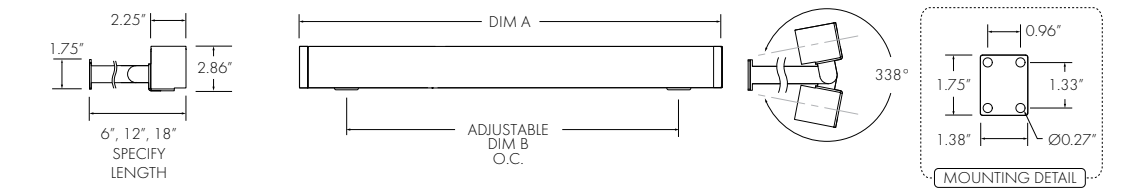
EXTENDED ARM, BACK MOUNT (EAB-X) - 12" FIXTURE LENGTH

A 48" white leader cable (left hand power feed) is provided on all fixtures



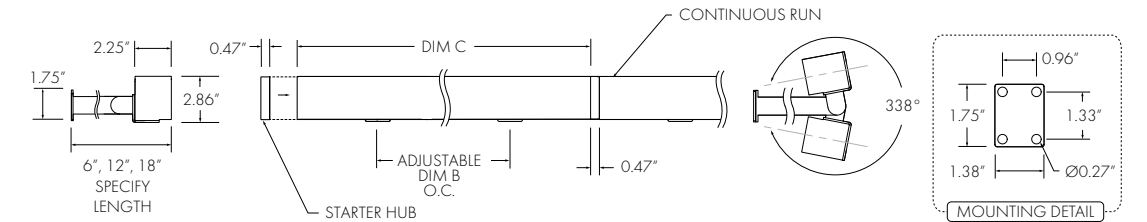
EXTENDED ARM, BACK MOUNT (EAB-X) - 24"-96" FIXTURE LENGTHS

A 48" white leader cable (left hand power feed) is provided on all fixtures



EXTENDED ARM, BACK MOUNT (EAB-X) - CONTINUOUS RUN

A 48" white leader cable (left hand power feed) is provided on all fixtures



Meydenbauer Center: Center Hall Remodel

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Type:
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PROJECT: TYPE: CATALOG #: MI - - - - - - - - - -

ROW LENGTH	FIXTURE LENGTHS/QUANTITIES				
	8' FIXTURES	7' FIXTURES	6' FIXTURES	5' FIXTURE	4' FIXTURES
9'				1 (START)	1 (END)
10'				2	
11'			1 (START)	1 (END)	
12'			2		
13'		1 (START)	1 (END)		
14'		2			
15'	1 (START)	1 (END)			
16'	2				
17'			2 (START + END)	1 (MID)	
18'			3		
19'		1 (MID)	2 (START + END)		
20'	2 (START + END)				1 (MID)
21'	2 (START + END)			1 (MID)	
22'	2 (START + END)		1 (MID)		
23'	2 (START + END)	1 (MID)			
24'	3				
25'				5	
26'	2 (START + END)			2 (MID)	
27'	2 (START + END)		1 (MID)	1 (MID)	
28'		4 (START + END)			
29'	3 (1-START + 2-MID)			1 (END)	
30'			5		
31'	3 (1-START + 2-MID)	1 (END)			
32'	4				
33'		4 (2-START + 2-END)		1 (MID)	
34'		4 (2-START + 2-END)	1 (MID)		
35'		5			
36'	4 (2-START + 2-END)				1 (MID)
37'	4 (2-START + 2-END)			1 (MID)	
38'	4 (2-START + 2-END)		1 (MID)		
39'	4 (2-START + 2-END)	1 (MID)			
40'	5				

WIRING

MAXIMUM RUN LENGTH - 0-10V, LUTRON HIGH-LUME (CIRCUITS MAY NOT BE LOADED OVER 10 AMPS)

LOW OUTPUT (3.5 W/FT)		MEDIUM OUTPUT (9.0 W/FT)		HIGH OUTPUT (15.0 W/FT)	
120V	277V	120V	277V	120V	277V
340 FEET	790 FEET	132 FEET	305 FEET	80 FEET	184 FEET

MAXIMUM FIXTURES (PER POWER FEED LOCATION) - DMX DIMMING

LOW OUTPUT (3.5 W/FT)		MEDIUM OUTPUT (9.0 W/FT)		HIGH OUTPUT (15.0 W/FT)	
120V	277V	120V	277V	120V	277V
32 FIXTURES	32 FIXTURES	32 FIXTURES	32 FIXTURES	UP TO 32 FIXTURES	UP TO 32 FIXTURES
NOT TO EXCEED 1200 WATTS		NOT TO EXCEED 1200 WATTS		NOT TO EXCEED 1200 WATTS	



Meydenbauer Center: Center Hall Remodel

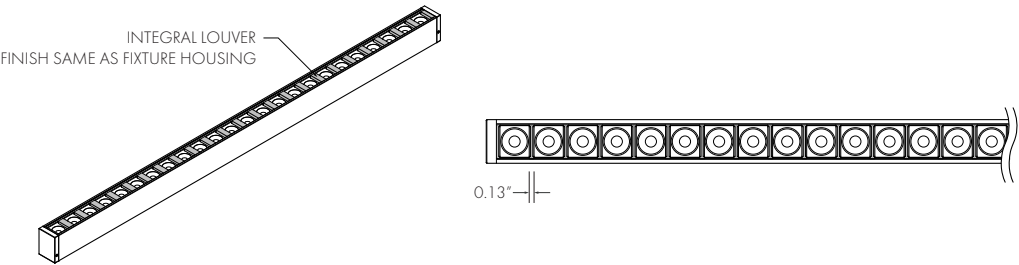
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Type:
L6

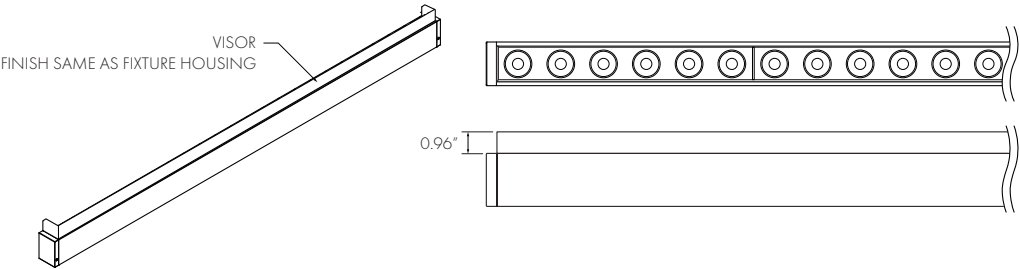
PROJECT: TYPE: CATALOG #: MI - - - - - - - - - -

ACCESSORY OPTIONS

INTEGRAL LOUVER (ILV)

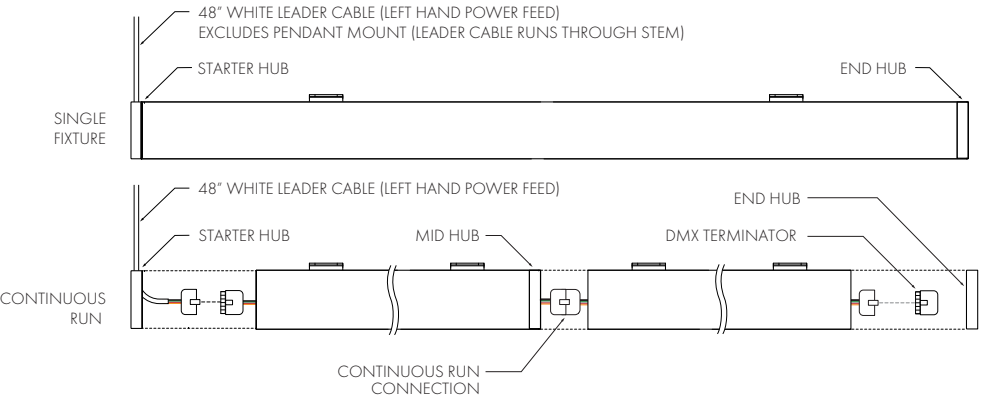


VISOR (VS) Visor available in up to 4 ft. lengths – multiple visors required for fixtures longer than 4 ft.



INSTALLATION SUMMARY

A 48" white leader cable (left hand power feed) is provided on all fixtures



Revised July 16, 2025
Specifications subject to change without notice



Meydenbauer Center: Center Hall Remodel

250028
CONSTRUCTION DOCUMENTS
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Type:
L6

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. System smoke detectors.

1.2 GENERAL REFERENCES

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section. Requirements noted in this Section are supplemental to the requirements of these General References.

1.3 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code.
- B. NFPA 72 - National Fire Alarm and Signaling Code; National Fire Protection Association.
- C. NFPA 101 - Life Safety Code.
- D. UL 268 - Standard for Smoke Detectors for Fire Alarm Systems.

1.4 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with local building codes and standards of all authorities having jurisdiction for design and installation of fire alarm systems.
- B. NFPA Compliance: Comply with NFPA 72 "National Fire Alarm and Signaling Code" for fire alarm system design, construction, and installation standards.
- C. Source Limitations for Fire Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.
- D. All components provided shall be listed for use with the selected system.
- E. Materials shall bear label, stamp, or other markings of specified testing agency.
- F. Electrical Components, Devices, and Accessories: Listed and labeled as defined NFPA 70, by a qualified testing agency, and marked for intended application.
- G. All materials and equipment shall be UL listed and approved by FM Global.

1.5 SUBMITTALS

A. Action Submittals

1. Product Data:

a. For each type of product.

- 1) Include construction details, material descriptions, dimensions, profiles, and finishes.
- 2) Include rated capacities, operating characteristics, and electrical characteristics, and furnished specialties accessories.

2. Shop Drawings:
 - a. Prepare in accordance with NFPA 72.
 - 1) Include plans, elevations, sections, details, and attachments to other work.
 - 2) Include details of equipment assemblies.
 - 3) Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations.
 - 4) Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
 - 5) Detail assembly and support requirements.
 - 6) Include voltage drop calculations for notification appliance circuits.
 - 7) Include battery size calculations.
 - 8) Include input/output matrix.
 - 9) Include circuit and zone schedules on each floor plan sheet referencing all circuits and zones indicated on plan.
 - 10) Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
 - 11) Include performance parameters and installation details for each detector.
 - b. Include diagrams for power, signal, and control wiring.
3. Delegated-Design Submittal: Submit documents and calculations for fire alarm systems and appurtenances required or indicated to comply with performance requirements and design criteria. Shop drawing and calculations shall be signed and sealed by the NICET certified technician, responsible for their preparation.
 - a. Shop Drawings shall be prepared by persons with the following qualifications:
 - 1) Trained and certified by manufacturer in fire alarm system design.
 - 2) NICET-certified, fire alarm technician; Level III minimum.
 - 3) Retain if authorities having jurisdiction have licensing requirements Licensed or certified by authorities having jurisdiction.

B. Informational Submittals

1. Qualification Data: For qualified installer, fabricator, professional engineer, and NICET-certified technician.
2. Design Data: Approved fire alarm system working plans, prepared in accordance with NFPA 72, including documented approval by AHJs, and including structural calculations. Submittals shall be approved by Architect and Engineer prior to submitting them to authorities having jurisdiction.

C. Closeout Submittals

1. After completing a fire alarm system installation, the Contractor shall submit to the authority having jurisdiction a written certification that the system has been installed in accordance with the approved plans and tested in accordance with NFPA 72 and manufacturer's recommendations.

D. Operation and Maintenance Materials

1. Include manufacturer's descriptive literature, operating instructions, cleaning procedures, replacement parts list, maintenance data, and repair data.
2. Provide "Inspection and Testing Form" according to the "Inspection, Testing, and Maintenance" chapter in NFPA 72, and include the following:

- a. Equipment tested.
 - b. Frequency of testing of installed components.
 - c. Frequency of inspection of installed components.
 - d. Requirements and recommendations related to results of maintenance.
 - e. Manufacturer's user training manuals.
3. Include manufacturer's required maintenance related to system warranty requirements.

E. Record Documents

1. Comply with the "Records" section of the "Inspection, Testing, and Maintenance" chapter in NFPA 72.
 - a. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documentation" section of the "Documentation" chapter in NFPA 72.
 - 1) Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
 - 2) Riser diagram.
 - 3) Device addresses.
2. Record As-built drawings.
3. Record calculations.
4. Record digital files.
 - a. Digital layout models.
 - b. Product data.
 - c. Final submittals with responses.
5. Record copy of site-specific software.

1.6 WARRANTIES

- A. Special Warranty: Manufacturer agrees to repair or replace fire alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 2. Warranty Period: Five years from date of Substantial Completion.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire alarm Level II technician.
- C. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

1.8 FIELD CONDITIONS

- A. Interruption of Existing Fire Alarm Service: Do not interrupt fire alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:
 - 1. Notify Architect no fewer than seven days in advance of proposed interruption of fire alarm service.
 - 2. Do not proceed with interruption of fire alarm service without Architect 's written permission.
- B. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.
- C. Sequencing and Scheduling:
 - 1. Existing Fire Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire alarm equipment "NOT IN SERVICE" until removed from the building.
 - 2. Equipment Removal: After acceptance of new fire alarm system, remove existing disconnected fire alarm equipment and wiring including abandoned wiring above accessible ceilings.

PART 2 PRODUCTS

2.1 SYSTEM SMOKE DETECTORS

- A. General Requirements for System Smoke Detectors:
 - 1. Comply with UL 268; operating at 24-V dc, nominal.
 - 2. Detectors shall be two-wire type.
 - 3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire alarm control unit.
 - 4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
 - 5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 - 6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
- B. Photoelectric Smoke Detectors:
 - 1. Detector address shall be accessible from fire alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 - 2. An operator at fire alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
 - 1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
 - 1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 - 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
 - 3. All fire alarm conduit shall be red in color.
- B. Connecting to Existing Equipment: Verify that existing fire alarm system is operational before making changes or connections.
 - 1. Connect new equipment to existing control panel in existing part of the building.
 - 2. Expand, modify, and supplement existing control equipment as necessary to extend existing control functions to the new points. New components shall be capable of merging with existing configuration without degrading the performance of either system.
- C. Smoke- or Heat-Detector Spacing:
 - 1. HVAC: Locate detectors not closer than 36 inch from air supply diffuser or return air opening.
 - 2. Lighting Fixtures: Locate detectors not closer than 12 inch from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- D. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- E. Pathways shall be installed in EMT dedicated to fire alarm systems only.

3.3 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by Owner.

- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- D. Fire alarm system will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION 284600

LIMITED HAZARDOUS MATERIALS SURVEY REPORT

Meydenbauer Targeted Asbestos and Lead Assessment

Meydenbauer Center
11100 NE 6th Ave
Bellevue, Washington 98004

Prepared for:

Meydenbauer Center

11100 NE 6th Ave Bellevue Washington 98004

Report Date: December 19, 2025

Prepared By:



13810 SE Eastgate Way Suite 440 Bellevue WA 98005

TRC Project: 710871

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Appendices

Appendix A – Sample Location Diagrams
Appendix B – Representative Photographs
Appendix C – Laboratory Results and Chain of Custody
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EXECUTIVE SUMMARY

Meydenbauer Center contracted TRC Environmental Corporation (TRC) to conduct a limited scope hazardous materials survey at 11100 NE 6th Avenue in Bellevue, Washington. The survey was limited to the materials in the path of construction for the upcoming renovations to the Center Hall and adjacent Lobby area. The survey activities were initiated on December 10, 2025, by Conor Foley, Asbestos Hazard Emergency Response Act (AHERA) accredited Asbestos Building Inspector #198894.

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled contained detectable levels of asbestos, based on the PLM method. Any materials uncovered during renovation or demolition activities that are not addressed in this inspection report, or assumed asbestos-containing materials, must be sampled by an accredited asbestos inspector prior to any disturbance, or they must be treated as ACM.

Lead Containing Paint Sampling Results

Results of the survey completed by TRC indicate that no lead was detected above the reportable limit in the paint chip samples collected.

INTRODUCTION

Meydenbauer Center contracted TRC Environmental Corporation (TRC) to conduct a limited scope hazardous materials survey at 11100 NE 6th Avenue, Bellevue, Washington 98004. The survey was limited to the materials in the path of construction for the upcoming renovations to the Center Hall and adjacent Lobby area. The survey activities were initiated on December 10, 2025, by Conor Foley, Asbestos Hazard Emergency Response Act (AHERA) accredited Asbestos Building Inspector #198894.

PROPERTY INFORMATION

Property Information Meydenbauer Targeted Asbestos And Lead Assessment Meydenbauer Center	
Address	11100 NE 6th Avenue, Bellevue, Washington 98004
Description	Conference Center
Number of Stories	4
Total Square Footage	54,000
Floors	Carpet over Concrete
Interior Walls	Wallboard with some paneling

BACKGROUND

Asbestos Containing Materials

Occupational Safety and Health Administration (OSHA) defines asbestos-containing material (ACM), as any material containing more than one percent asbestos.

The Environmental Protection Agency (EPA) defines ACM as follows:

- Friable asbestos-containing material (ACM) is defined by the Asbestos NESHAP, as any material containing more than one percent (1%) asbestos as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy (PLM), that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure.
- Nonfriable ACM is any material containing more than one percent (1%) asbestos as determined using the PLM method that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure. The EPA further defines two categories of nonfriable ACM:
 - Category I (Cat I) - Category I nonfriable ACM is any asbestos-containing packing, gasket, resilient floor covering or asphalt roofing product which contains more than one percent (1%) asbestos as determined using PLM according to the method specified in Appendix A, Subpart F, 40 CFR Part 763, and
 - Category II (Cat II) - Category II nonfriable ACM is any material, excluding Category I nonfriable ACM, containing more than one percent (1%) asbestos as determined using PLM according to the methods specified in Appendix A, Subpart F, 40 CFR Part 763 that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.
 - Regulated Asbestos-Containing Material (RACM) is (a) friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding, grinding, cutting or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

Asbestos Sampling Procedures

The survey was conducted in accordance with the sample collection protocols established in 40 CFR 763 (ASHERA), 40 CFR 61 Subpart M (NESHAP). A summary of survey activities is provided below.

Survey activities began with visual observation of the project area to identify homogeneous areas of suspect ACM. A homogeneous area consists of building materials that appear similar throughout in terms of color and texture that does not extend to other buildings or floors. Visual assessments were conducted in accessible areas of the building. Building materials identified as glass, wood or metal were not considered suspect ACM.

A physical assessment of each homogeneous area of suspect ACM was conducted to assess the friability and condition of the materials. Friability was assessed by physically touching suspect materials.

Based on results of the visual observation, bulk samples of suspect ACM were collected in accordance with Washington State Department of Occupational Safety and Health (DOSH) sampling protocols. Samples of suspect materials were collected in each homogeneous area. Bulk samples were collected using wet methods as applicable to reduce the potential for fiber release. Samples were placed in sealable containers and labeled with unique sample numbers using an indelible marker. Note that multiple bulk samples are collected from each homogenous area of suspect ACM observed. In accordance with U.S. EPA guidelines, multiple samples are collected from each homogenous area of miscellaneous, thermal system insulation, and surfacing materials. Note that if one or more samples within a homogenous area of suspect ACM are positive for asbestos, then all of the suspect ACM must be treated as asbestos-containing material.

Bulk samples were submitted under proper COC documentation to the laboratory. Bulk samples were analyzed by PLM utilizing the EPA's, Method for the Determination of Asbestos in Bulk Building Materials, EPA 600/M4-82-020. Analysis by PLM was performed by visual observation of the bulk sample and slides prepared of the bulk sample for microscopic examination and identification. The samples were analyzed for asbestos (Chrysotile, Amosite, Crocidolite, Anthophyllite, and Actinolite/Tremolite), fibrous non-asbestos constituents (mineral wool, cellulose, etc.) and non-fibrous constituents. Using a stereoscope, the microscopist visually estimated the relative amounts of each constituent by determining the estimated area of the asbestos compared with the area estimate of the total sample.

Paint Chip Sampling

TRC conducted a lead paint inspection to identify loose and flaking lead-based paint (LBP) and/or lead-containing paint (LCP) and lead-containing materials (LCM) at the Site. The lead paint survey was performed to identify representative testing combinations of suspect LBP on painted surfaces that made up the majority of the coating in each area assessed that would present a hazard during demolition activities.

The general purpose of this investigation was to confirm the presence and determine the location of loose and flaking lead-based paint coatings and components, that will be disturbed in association with the renovation or demolition of the Site. TRC has documented the general condition of such painted building surfaces, characterized the composition of painted surfaces with regard to lead content, and quantified areas/components to define the magnitude to which loose and flaking LBP is present, where encountered. Information derived from this investigation may be used in communicating potential lead exposure hazards to workers performing abatement and/or demolition.

The scope of work associated with this investigation included the following elements:

- Visual inspection of painted surfaces and components;
- Testing of select loose and flaking painted surfaces and components using paint chip analysis; and
- Assess condition and approximate quantities of LBP/LCP for reporting purposes.

Lead-based paint (LBP) is defined by the United States Department of House and Urban Development (HUD) as any paint, varnish, stain, or other applied coating that has one mg/cm² or more of lead or 0.5% by weight (5,000 micrograms per gram [ug\g] or 5,000 parts of lead per million [ppm]). According to the OSHA Program Directive, Lead: Exposure in Construction, "For all occupational exposure to lead occurring in the course of construction work, the standard (1926.62) does not specify a minimum amount or concentration of lead that triggers a determination that lead is present and the potential for occupational exposure exists." Therefore, any paint containing less than 0.5% by weight, but greater than the laboratory detection limit is considered to be a LCP.

Paint chip samples were collected from painted surfaces to determine total lead content and assist in determining Occupational Safety and Health Administration (OSHA) requirements with respect to construction activities which may disturb lead-containing paints.

All paint chip samples were submitted under proper COC documentation to the laboratory. Samples were analyzed by Flame AAS utilizing the Environmental Protection Agency's (EPA) Test Method for Evaluating Solid Waste, Physical / Chemical Methods, EPA SW-846 Method 7420.

Laboratory Analysis

Laboratory services were provided by EMC Labs, Inc., a National Voluntary Laboratory Accreditation Program (NVLAP) certified laboratory (NVLAP code #101586) located in Phoenix, Arizona.

FINDINGS

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled contained detectable levels of asbestos, based on the PLM method.

Negative Materials (No Asbestos Detected)

Results of the bulk sampling indicated none of the following sampled materials contained detectable levels of asbestos, based on the PLM method:

Asbestos Negative Materials Meydenbauer Targeted Asbestos and Lead Assessment Meydenbauer Center					
Samples	Material / Accessible	Location	Percentage/ Type	Approx. Quantity	Condition / Material Type / NESHAP Category
MC-1A MC-1B MC-1C	Black And Yellow Carpet Adhesive	In Lobby at Entry to Halls A and B	NAD / NA	1000 SF	Good Misc.
MC-2A MC-2B MC-2C	Grey Fabric For Room Partitions	Room Dividers	NAD / NA	10500 SF	Good Misc.

Asbestos Negative Materials Meydenbauer Targeted Asbestos and Lead Assessment Meydenbauer Center					
Samples	Material / Accessible	Location	Percentage/ Type	Approx. Quantity	Condition / Material Type / NESHAP Category
MC-3A MC-3B MC-3C	Clear/Grey Carpet Adhesive	On floor in both Halls and Lobby	NAD / NA	30000 SF	Good Misc.
MC-4A MC-4B MC-4C	Grey Leveling Compound	Under Carpet at Floor Transitions	NAD / NA	100 SF	Good Misc.
MC-5A MC-5B MC-5C	Brown, Grey Wallboard Gypsum with Joint Compound	Lower Walls in Both Halls	NAD / NA	5000 SF	Good Misc.

NAD – No Asbestos Detected NA – Not Applicable

Paint Chip Sampling Results

Lead Paint Chip Meydenbauer Targeted Asbestos And Lead Assessment Meydenbauer Center				
Sample Number	Location(s)	Description	Substrate	% Lead (by weight)
MC-PB-1	On Wood Paneling in Center Hall	Brown Paint	Wood	< 0.21%
MC-PB-2	On Wood Paneling in Center Hall	Grey Metallic Paint	Wood	< 0.10%
MC-PB-3	On Drywall in Center Hall	Brown Paint	Drywall	< 0.14%

BRL – Below Reportable Limit

Results of laboratory analysis indicate that no lead was detected in the paint chip samples that were collected and analyzed.

RECOMMENDATIONS

Asbestos Containing Materials

Results of the bulk sampling indicated none of the materials sampled contained detectable levels of asbestos, based on the PLM method. Any materials uncovered during renovation/demolition activities that are not addressed in this inspection report, or suspect asbestos-containing material must be sampled by an accredited asbestos inspector prior to any disturbance, or they must be treated as asbestos containing.

Lead Containing Paints

Results of laboratory analysis indicate that no lead was detected above the reportable limit in the paint chip samples collected from the Center Hall and Lobby area of the Meydenbauer Center. As such, the paints are not considered lead-containing materials.

DISCLAIMER

The content presented in this report is based on data collected during the site inspection and survey, review of pertinent regulations, requirements, guidelines and commonly followed industry standards, and information provided by Client, their clients, agents, and representatives.

The work has been conducted in an objective and unbiased manner and in accordance with generally accepted professional practice for this type of work. TRC believes the data and analysis to be accurate and relevant but cannot accept responsibility for the accuracy or completeness of available documentation or possible withholding of information of other parties.

This limited hazardous materials survey report is designed to aid the property owner, architect, construction manager, general contractor, and asbestos abatement contractor in locating asbestos containing materials, lead containing paints, suspect PCB containing equipment and suspect mercury containing equipment. This report is not intended for, and may not be utilized as, a bidding document or as an abatement project specification document.

Respectfully,

TRC Environmental Corporation

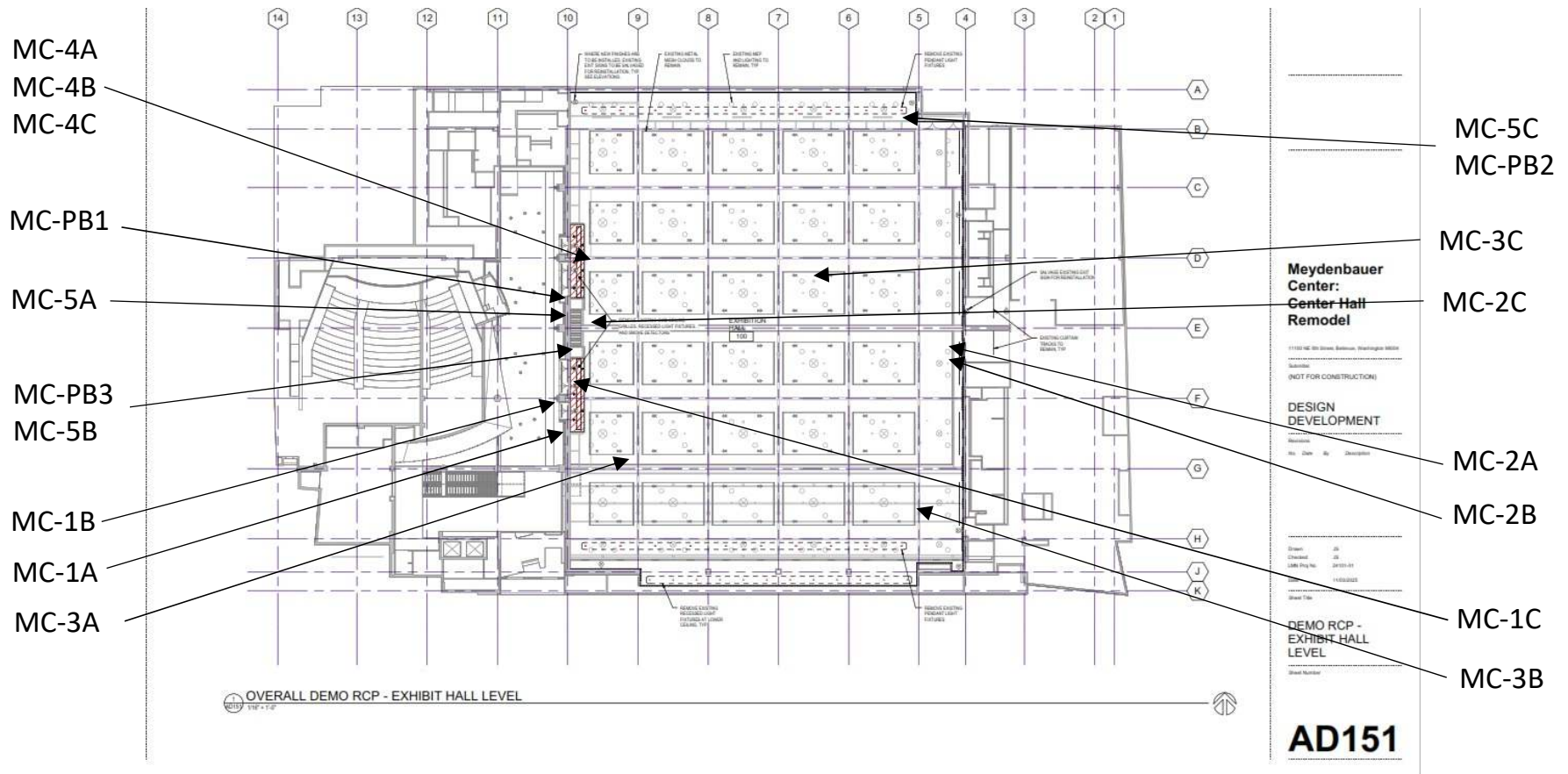


Conor Foley, CIH
SIH Technical Manager



Ron Landolt
NW Region SIH Team Leader

APPENDIX A – SAMPLE LOCATION DIAGRAMS



13810 SE Eastgate Way
Suite 440
Bellevue, WA 98005
425.395.0010

SAMPLE LOCATION DIAGRAM

TARGETED ASBESTOS AND LEAD ASSESSMENT
MEYDENBAUER CENTER
11100 NE 6TH AVE, BELLEVUE, WA 98004
TRC Project Number: 710871

APPENDIX B – REPRESENTATIVE PHOTOGRAPHS

MEYDENBAUER TARGETED ASBESTOS AND LEAD ASSESSMENT SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: MC-1A, MC-1B, MC-1C
Material Description: Carpet Adhesive
Material Color: Black and Yellow
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Not Detected
Asbestos Type: N/A
Homogeneous Area: In Lobby at entry to Halls A and B.
Total Approximate Quantity: 1000 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable



Sample Numbers: MC-2A, MC-2B, MC-2C
Material Description: Fabric for Room Partitions
Material Color: Grey
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Not Detected
Asbestos Type: N/A
Homogeneous Area: Room Dividers.
Total Approximate Quantity: 10500 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable



Sample Numbers: MC-3A, MC-3B, MC-3C
Material Description: Carpet Adhesive
Material Color: Clear/Grey
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Not Detected
Asbestos Type: N/A
Homogeneous Area: On floor in both halls and Lobby.
Total Approximate Quantity: 30000 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable



MEYDENBAUER TARGETED ASBESTOS AND LEAD ASSESSMENT SUSPECT ASBESTOS CONTAINING MATERIALS PHOTOGRAPHIC LOG

Sample Numbers: MC-4A, MC-4B, MC-4C
Material Description: Leveling Compound
Material Color: Grey
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Not Detected
Asbestos Type: N/A
Homogeneous Area: Under carpet at floor transitions.
Total Approximate Quantity: 100 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable



Sample Numbers: MC-5A, MC-5B, MC-5C
Material Description: Wallboard Gypsum with Joint Compound
Material Color: White
Accessible Material: Accessible
Reason Inaccessible: N/A
Asbestos Detected: Not Detected
Asbestos Type: N/A
Homogeneous Area: Lower walls in both halls.
Total Approximate Quantity: 5000 SF
Condition: Good
Material Type: Misc.
NESHAP Category: N/A
Notes: Not Applicable



MEYDENBAUER TARGETED ASBESTOS AND LEAD ASSESSMENT LEAD CONTAINING PAINT PHOTOGRAPHIC LOG

Sample Numbers: MC-PB-1
Sample Location: Wood Paneling
Description: Brown Paint
Laboratory Result (%): <0.021
Substrate: Wood
Paint Locations: Wood Paneling in Center Halls
Quantity of Deteriorated Paint (SF): None



Sample Numbers: MC-PB-2
Sample Location: Back Wall Of Both Halls
Description: Grey Metallic Paint
Laboratory Result (%): <0.010
Substrate: Wood
Paint Locations: Wood Paneling in Center Halls
Quantity of Deteriorated Paint (SF): None



Sample Numbers: MC-PB-3
Sample Location: On Lower Drywall
Description: Brown Paint
Laboratory Result (%): <0.014
Substrate: Drywall
Paint Locations: Drywall in Center Halls
Quantity of Deteriorated Paint (SF): None



APPENDIX C – LABORATORY RESULTS AND CHAIN OF CUSTODY



BULK ASBESTOS ANALYSIS REPORT

CLIENT: Meydenbauer Center

Lab Log #: 0068625
Project #: 710871.0000.0000
Date Received: 12/11/2025
Date Analyzed: 12/12/2025

Site: Center Hall, 11100 NE 6th Street, Bellevue, WA

POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials	Asbestos %	Asbestos Type
MC-1A	See Diagram	Black/Yellow Carpet Adhesive	5% cellulose	ND	None
MC-1B	See Diagram	Black/Yellow Carpet Adhesive	5% cellulose	ND	None
MC-1C	See Diagram	Black/Yellow Carpet Adhesive	5% cellulose	ND	None
MC-2A	See Diagram	Grey fabric for room partitions	95% synthetic fiber	ND	None
MC-2B	See Diagram	Grey fabric for room partitions	95% synthetic fiber	ND	None
MC-2C	See Diagram	Grey fabric for room partitions	95% synthetic fiber	ND	None
MC-3A	See Diagram	Colorless/Grey Carpet Adhesive	- - -	ND	None
MC-3B	See Diagram	Colorless/Grey Carpet Adhesive	- - -	ND	None
MC-3C	See Diagram	Colorless/Grey Carpet Adhesive	- - -	ND	None
MC-4A	See Diagram	Grey Leveling Compound	10% cellulose	ND	None
MC-4B	See Diagram	Grey Leveling Compound	10% cellulose	ND	None
MC-4C	See Diagram	Grey Leveling Compound	10% cellulose	ND	None
MC-5A	See Diagram	LAYER 1 White Joint Compound	- - -	ND	None
MC-5A		LAYER 2 Grey Wallboard, Gypsum	5% cellulose	ND	None
MC-5B	See Diagram	LAYER 1 White Joint Compound	- - -	ND	None
MC-5B		LAYER 2 Grey Wallboard, Gypsum	5% cellulose	ND	None

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVLAP Lab Code 101424-0
RI #PLM00007 TX #300354
CO# AL-21772

AIHA LAP #100122
VT #An-000020
LA#05011

CT #PH-0426
VA #3333 000283
PA#68-03387

ME LB-0071
AZ #AZ0944
PHIL#ALL-461

MA #AA000052
HI #L-09-004

NY #10980 WV #000622
NV #CT00004 CA #2907
WA #C1071



POLARIZED LIGHT MICROSCOPY by EPA 600/R-93/116

Sample No.	Sample Location	Homogeneous Material Description	Other Matrix Materials	Asbestos %	Asbestos Type
MC-5C	See Diagram	LAYER 1 White Joint Compound	- - -	ND	None
MC-5C		LAYER 2 Grey Wallboard, Gypsum	5% cellulose	ND	None

ND - asbestos was not detected

Trace - asbestos was observed at level of 1% or less - This is the reporting limit

NA/PS - Not Analyzed / Positive Stop

SNA - Sample Not Analyzed- See Chain of Custody for details

Notes: Asbestos-Containing Material (ACM) is any material containing more than 1% asbestos

Note: Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar non-friable organically bound materials. In those cases, EPA recommends, and certain states (e.g. NY) require, that negative results be confirmed by quantitative transmission electron microscopy.

The Laboratory at TRC follows 18/01A EPA -- 40 CFR Appendix E to subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples and 18/A03 EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials which utilize polarized light microscopy (PLM). Our analysts have completed an accredited course in asbestos identification. TRC's Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP), for Bulk Asbestos Fiber Analysis, NVLAP Code 101424-01. TRC is accredited by the AIHA Laboratory Accreditation Programs AIHA LAP (ID: LAP-100122) in the Industrial Hygiene Program (IHLAP) for PLM. Asbestos content is determined by visual estimate unless otherwise indicated. Quality Control is performed in-house on at least 10% of samples and QC data related to the samples is available upon written request from client.

This report shall not be reproduced, except in full, without the written approval of TRC. This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested, as received by the laboratory.

Analyzed by: Najaat Bhura
Najaat Bhura, Quality Manager

Reviewed by: Kathleen Williamson
Kathleen Williamson, Laboratory Manager

Date Issued
12/15/2025

TRC LABORATORY ASBESTOS ANALYTICAL ACCREDITATIONS

NVLAP Lab Code 101424-0
RI #PLM00007 TX #300354
CO# AL-21772


AIHA LAP #100122
VT #An-000020
LA#05011

CT #PH-0426
VA #3333 000283
PA#68-03387


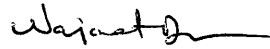
ME LB-0071
AZ #AZ0944
PHIL#ALL-461

MA #AA000052
HI #L-09-004

NY #10980 WV #000622
NV #CT00004 CA #2907
WA #C1071

 4000 SE International Way Suite F101 Milwaukie OR 97222			ASBESTOS BULK SAMPLE CHAIN OF CUSTODY FORM		
Client: Meydenbauer Center			Project Number: 710871		Sampling Technician: Mobile App: SIH - Portland - HAZMAT Survey
Project Name: Meydenbauer Targeted Asbestos and Lead Assessment			Tracking Number:		Requested TAT: 5 DAY
ASBESTOS BULK SAMPLE INFORMATION					
Sample Date	Sample Identification	Material Description	Homogeneous Area	Sample Location	Analysis Requested
12/10/25	MC-1A	Black and Yellow Carpet Adhesive	In Lobby At Entry To Halls A And B	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-1B	Black and Yellow Carpet Adhesive	In Lobby At Entry To Halls A And B	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-1C	Black and Yellow Carpet Adhesive	In Lobby At Entry To Halls A And B	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-2A	Grey fabric for room partitions	Room Dividers	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-2B	Grey fabric for room partitions	Room Dividers	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-2C	Grey fabric for room partitions	Room Dividers	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-3A	Clear/Grey Carpet Adhesive	On Floor In Both Halls And Lobby	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-3B	Clear/Grey Carpet Adhesive	On Floor In Both Halls And Lobby	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-3C	Clear/Grey Carpet Adhesive	On Floor In Both Halls And Lobby	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-4A	Grey Leveling Compound	Under Carpet At Floor Transitions	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-4B	Grey Leveling Compound	Under Carpet At Floor Transitions	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-4C	Grey Leveling Compound	Under Carpet At Floor Transitions	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-5A	Wallboard, Gypsum with Joint Compound, Brown, Grey	Lower Walls In Both Halls	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-5B	Wallboard, Gypsum with Joint Compound, Brown, Grey	Lower Walls In Both Halls	See Diagram	PLM EPA 600/R-93/116
12/10/25	MC-5C	Wallboard, Gypsum with Joint	Lower Walls In Both Halls	See Diagram	PLM EPA 600/R-

68625

	Compound, Brown, Grey		93/116
Special Instruction to Laboratory: N/A			
CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION			
Delivery Method: Third Party Shipping Service	Date and Time 12/10/25	Received By:	Date and Time
Relinquished By: (Print): Conor Foley	12/10/2025 12:29 pm America/Los_Angeles	(Print): Najaat Bhura	12/11/25 1130
(Sign): 		(Sign): 	
(Print):		(Print):	
(Sign):		(Sign):	
Email Results To: CFoley@trccompanies.com	Analytical Method: PLM EPA 600/R-93/116	Lab Comments:	



9830 South 51st Street, Suite B-109 / PHOENIX, ARIZONA 85044 / 480-940-5294 or 800-362-3373 / FAX 480-893-1726
emclab@emclabs.com

LEAD (Pb) IN PAINT CHIP SAMPLES
EMC SOP METHOD #L01/1 EPA SW-846 METHOD 7420

EMC LAB #: L113259		DATE RECEIVED: 12/11/2025	
CLIENT: TRC Solutions		REPORT DATE: 12/16/2025	
		DATE OF ANALYSIS: 12/12/2025	
CLIENT ADDRESS: 4105 SE International Way Suite 505 Milwaukie, OR 97222		P.O. NO.:	
PROJECT NAME: Maydenbauer Targeted Asbestos + Lead Assessment		PROJECT NO.: 710871	


EMC # L113259-	SAMPLE DATE /25	CLIENT SAMPLE #	DESCRIPTION	REPORTING LIMIT (%Pb by weight)	%Pb BY WEIGHT
1	12/10	MC-PB-1	Brown Paint-Wood-Wood Paneling	0.021	BRL
2	12/10	MC-PB-2	Grey Metallic Paint-Wood-Back Wall of Both Halls	0.010	BRL
3	12/10	MC-PB-3	Brown Paint-Drywall-On Lower Drywall	0.014	BRL

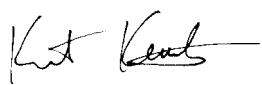
^ = Dilution Factor Changed * = Excessive Substrate May Bias Sample Results **BRL** = Below Reportable Limits # = Very Small Amount Of Sample Submitted, May Affect Result

This report applies to the standards or procedures identified and to the samples tested only. The test results are not necessarily indicative or representative of the qualities of the lot from which the sample was taken or of apparently identical or similar products, nor do they represent an ongoing quality assurance program unless so noted. Unless otherwise noted, all quality control analyses for the samples noted above were within acceptable limits.

Where it is noted that a sample with excessive substrate was submitted for laboratory analysis, such analysis may be biased. The lead content of such sample may, in actuality, be greater than reported. EMC makes no warranty, express or implied, as to the accuracy of the analysis of samples noted to have been submitted with excessive substrate. Resampling is recommended in such situations to verify original laboratory results. EMC Labs, Inc. (ID 101586) is accredited by the AIHA Laboratory Accreditation Programs, LLC (AIHA-LAP, LLC) in the Environmental Lead accreditation program(s) for Paint, Settled Dust by Wipe, Soil and Airborne Dust Fields of Testing as documented by the Scope of Accreditation Certificate and associated Scope. AIHA-LAP, LLC accreditation complies with the ISO/IEC Standard 17025:2017 requirements. The customer provides the Project number, name, address, sampling date, identification, and description. EMC Labs, Inc. is an EPA Recognized Testing Lab.

These reports are for the exclusive use of the addressed client and are rendered upon the condition that they will not be reproduced wholly or in part for advertising or other purposes over our signature or in connection with our name without special written permission. Samples not destroyed in testing are retained a maximum of sixty (60) days.

ANALYST: 
 Jason Thompson

QA COORDINATOR: 
 Kurt Kettler

APPENDIX D – CERTIFICATIONS

Certificate of Completion

This is to certify that

Conor Foley


has satisfactorily completed
4 hours of online refresher training as an
AHERA Building Inspector

to comply with the training requirements of
TSCA Title II, 40 CFR 763 (AHERA)

EPA Provider # 1085

198894

Certificate Number



Instructor: Sue Maas

Oct 28, 2025

Expires in 1 year.

Date(s) of Training

Exam Score: N/A
(if applicable)



- Facilities
- Environmental
- Geotechnical
- Materials