TOWN OF BENNETT

COMMUNITY SAFETY BUILDING

TENANT FINISH REMODEL

365 PALMER AVENUE
BENNETT, COLORADO 80102

ALLRED&ASSOCIATES

PROJECT MANUAL

July 28, 2023

2303PROJECT DIRECTORY

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TABLE OF CONTENTS

DIVISION 00 - INTRODUCTORY INFORMATION, BIDDING REQUIREMENTS AND CONTRACT REQUIREMENTS (NOT USED)

NOT USED - PROVIDED BY THE TOWN OF BENNETT

DIVISION 01 - GENERAL REQUIREMENTS

01001 –TABLE OF CONTENTS.....2
01010 - SUMMARY OF WORK 2
01027 - APPLICATIONS FOR PAYMENT..... 3
01028 - CHANGE ORDER PROCEDURES..... 2
01030 - ALTERNATES..... 1
01040 - COORDINATION 5
01045 - CUTTING AND PATCHING..... 3
01078 - DEFINITIONS AND EXPLANATIONS..... 2
01090 - REFERENCE STANDARDS 5
01105 - ADMINISTRATION, POCEDURES, CODES 3
01200 - PROJECT MEETINGS 3
01300 - SUBMITTALS 4
01322 - PHOTOGRAPHIC DOCUMENTATION..... 2
01500 - TEMPORARY FACILITIES..... 6
01561 - CONSTRUCTION CLEANING 2
01600 - MATERIALS AND EQUIPMENT 4
01631 - SUBSTITUTIONS 2
01690 - CONSTRUCTION WASTE MANAGEMENT AND RECYCLING 3
01700 - CONTRACT CLOSEOUT 4
01710 - FINAL CLEANING 1
01720 - PROJECT RECORD DOCUMENTS 2
01730 - OPERATING AND MAINTENANCE DATA 3
01740 - WARRANTIES AND BONDS 2

DIVISION 02 - SITE WORK (NOT USED)

DIVISION 03 – CONCRETE (NOT USED)

DIVISION 04 – MASONRY (NOT USED)

DIVISION 05 – METALS (NOT USED)

DIVISION 06 - WOOD AND PLASTICS

06062 - DECORATIVE PLASTIC LAMINATE 6
06200 - FINISH CARPENTRY..... 2
06402 - INTERIOR ARCHITECTURAL WOODWORK 5

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07210 - BUILDING INSULATION 2
07280 - INSULATING SPRAY FOAM SYSTEMS FOR WALLS 2
07620 - SHEET METAL FLASHING AND TRIM 3
07920 - JOINT SEALERS..... 15

DIVISION 08 - DOORS AND WINDOWS

08111 - HOLLOW METAL DOORS AND FRAMES 11
08210 - FLUSH WOOD DOORS 4
08411 - ALUMINUM- FRAMED ENTRANCES AND STOREFRONTS 7
08625 - TUBULAR DAYLIGHTING DEVICES 5
08711 - DOOR HARDWARE 21
08810 - GLAZING 6

DIVISION 09 – FINISHES

09216 – NON-STRUCTURAL METAL FRAMING 9
09260 – GYPSUM BOARD ASSEMBLIES 7
09300 – TILE 3
09305 – TILE ADHESIVES, MORTARS AND GROUTS 9
09511 – ACOUSTICAL PANEL CEILING 1
09653 – RESILIENT WALL BASE AND ACCESSORIES 4
09680 – CARPET 4
09775 – FIBERGLASS REINFORCED PLASTIC PANELS 2
09900 – PAINTS AND COATINGS 5

DIVISION 10 – SPECIALTIES

10430 – SIGNS 3
10505 – METAL LOCKERS 5
10523 – FIRE EXTINGUISHER, CABINETS AND ACCESSORIES 2
10800 – TOILET ROOM ACCESSORIES 2

DIVISION 11 – EQUIPMENT

11450 – RESIDENTIAL EQUIPMENT 2

DIVISION 12 – FURNISHINGS

12413 – ROLLER WINDOW SHADES 9

DIVISION 13 – SPECIAL CONSTRUCTION (NOT USED)

DIVISION 14 – CONVEYING SYSTEMS (NOT USED)

DIVISION 15 – MECHANICAL (SEE MECHANICAL DRAWINGS)

DIVISION 16 – ELECTRICAL (SEE ELECTRICAL DRAWINGS)

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A.General description of the work of the entire Project with limitations or coordination with other contracts, if any.

1.03 GENERAL

A. The work to be done under this Contract is the construction in a work-manlike manner, to the satisfaction of the Architect, of the Work as show, documented, and set forth in the Contract Documents.
B. If these documents or job conditions make it impossible to produce first class work or to warranty the work or its performance, or should discrepancies appear among the Contract Documents, request interpretation, correction or clarification. If the Contractor fails to make such request, work must be performed in a satisfactory manner and no request for added cost or extension of time will be considered.
C. Should conflict occur in or between Drawings and Specification, Contractor (or Installer) is deemed to have estimated on the more expensive way of doing work unless he shall have asked for and obtained written decision before submission of Bid as to which method or material will be required.
D. The Contractor represents that he fully understands the nature and extent of the work, all factors and conditions affecting or which may be affected by it and characteristics of its various parts and elements and their fitting together and functioning.

1.04 PROJECT DESCRIPTION

A. General
1. Briefly and without force and effect upon the contract documents, the Work of the Contract can be summarized as follows:
2. Project Identification: Bennett Community Safety Building
365 Palmer Avenue, Bennett CO 80102
3. Owner: Town Of Bennett, 207 Muegge Way, Bennett, Colorado, 80102
4. Remodel of an existing facility.

B. Scope of Work in This Contract:
1. This project will consist of the remodel of an existing building. It will include the conversion of an existing interior vehicle perking area into a finished office space. There will be an upgrade and replacement of the existing HVAC and lighting systems serving both the expanded office area as well as well as a more limited scope in the remaining vehicle parking bays. Garage doors will be replaced with aluminum storefront systems and additional exterior windows will be added in the expanded office area. Site work will be limited to include utility connections and a water service upgrade.
C. Project will be constructed under a single prime contract.

D. Any and all site construction activities shall take place as per the local jurisdictions indicated ordinances.

PART 2 - PRODUCTS (Not applicable)
PART 3 - EXECUTION (Not applicable)

END OF SECTION 01010

SECTION 01027 - APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SCHEDULE OF VALUES

A.Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.

1.Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

a.Contractor's Construction Schedule.

b. Application for Payment forms, including Continuation Sheets.
c. List of subcontractors.
d. Schedule of allowances.
e. Schedule of alternates.
f. List of products.
g. List of principal suppliers and fabricators.
h. Schedule of submittals.

2.Submit the Schedule of Values to the Architect at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment. payment.

B.Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a.Project name and location.

b. Name of the Architect.
c. Project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a.Related Specification Section or Division.

b. Description of Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value.
    1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.

5.Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.

a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.

6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

7.Unit-Cost Allowances: Show the line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.

8.Margins of Cost: Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.

a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.

9.Schedule Updating: Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.03 APPLICATIONS FOR PAYMENT

A.Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.

1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

B. Payment-Application Times: The date for each progress payment is the 15th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 15 days prior to the date for each progress payment.

C.Payment-Application Forms: Use AIA Document G702 and Continuation Sheets G703 as the form for Applications for Payment.

D. Application Preparation: Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Architect will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

E.Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to the Architect by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Architect.

F.Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.

1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.

a.Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

4.Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment, include the following:

1.List of subcontractors.

2. List of principal suppliers and fabricators.
3. Schedule of Values.
4. Contractor's Construction Schedule (preliminary if not final).
5. Schedule of principal products.
6. Schedule of unit prices.
7. Submittal Schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.

11. Copies of authorizations and licenses from governing authorities for performance of the Work.
12. Initial progress report.
13. Report of preconstruction meeting.
14. Certificates of insurance and insurance policies.

15.Performance and payment bonds.

16. Data needed to acquire the Owner's insurance.
17. Initial settlement survey and damage report, if required.

H. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
2. Administrative actions and submittals that shall precede or coincide with this application include:

a.Occupancy permits and similar approvals.

b. Warranties (guarantees) and maintenance agreements.
c. Test/adjust/balance records.
d. Maintenance instructions.
e. Meter readings.
f. Startup performance reports.
g. Changeover information related to Owner's occupancy, use, operation, and maintenance.
h. Final cleaning.
i. Application for reduction of retainage and consent of surety.
j. Advice on shifting insurance coverages.
k. Final progress photographs.
l. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.

I. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

1.Completion of Project closeout requirements.

2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Certified property survey.
7. Proof that taxes, fees, and similar obligations were paid.
8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish, and similar elements.
10. Change of door locks to Owner's access.
11. All punchlist items are complete.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01027

SECTION 01028 - CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A.Terms and conditions for change orders are set forth in the General Conditions. Procedures for processing change orders are specified herein.

1.03 SUBMITTALS

A. Submit the name of individual authorized to accept changes, and to be responsible for informing others in the Contractor's employ of changes in the work.
B. Submit Proposal Request Forms: AIA G709.
C. Submit Change Order Forms on AIA or Contractor's forms.

1.04 DOCUMENTATION

A. Maintain detailed records of the work completed. Provide complete information for evaluation of proposed changes and to substantiate changes in costs or Contract time.
B. Provide the following additional data to support calculations:
   1. All quantities of products and equipment.
   2. All labor costs associated with the work.
   3. Insurance and bonds.
   4. Overhead and profit within the limits set forth in General Conditions.
   5. Justifications for any change in Contract time.
   6. Credit for deletions from the Contract and similar documentation.
C. Include with request for change order the following additional information:
   1. Origin and date of claim.
   2. Dates, time and by whom work was performed.
   3. Time records and wage rates paid.
   4. Invoices and receipts for products, equipment and subcontracts.

1.05 PRELIMINARY PROCEDURES

A. The Architect may submit a Bulletin which may include description of change with supplementary or revised drawings and specifications, projected time for execution, and the time period for which the request will be valid.
B. The Contractor may initiate a change by submitting a request to the Architect which describes the proposed change with a statement of the reason for the change, change in Contract Sum and Contract Time and full documentation. For requested substitutions of products, follow procedures and documentation specified in Section 01631.

1.06 AUTHORIZATION

A. The Bulletin issued by the Architect may include a directive, signed by the Owner, instructing the Contractor to proceed with the Changes in the Work for inclusion in subsequent Change Order.
B. The Directive portion of the Bulletin will describe the changes in the Work and designate the method of determining the change in the Contract Sum or Contract Time.
C. Where the change order is not based upon pre-determined costs or quantities, changes in the Contract Sum or Contract Time will be computed on the basis of a force account change order.

1.07 LUMP SUM CHANGE ORDER

A. Lump sum change orders will be based upon the Bulletin and the Contractor's quotation, or Contractor's request for change order as approved by the Architect.
B. When requested by Architect submit detailed breakdown of costs as listed above under "DOCUMENTATION".

1.08 UNIT PRICE CHANGE ORDER

A. Where the change order is based upon unit prices established in the Contract or otherwise pre-determined, Change Order will be executed on a lump sum basis determined by multiplying the unit price by the actual in-place quantities, except where otherwise stated in the relevant specification sections.

1.09 FORCE ACCOUNT CHANGE ORDER

A. Contractor will submit an itemized account and supporting data after completion of the change following the time limits set forth in the General Conditions.
B. After receiving the itemized account and supporting data as described above under "DOCUMENTATION", the Architect will determine the allowable change in the Contract Sum or Contract Time.

1.10 EXECUTION

A. The Contractor will prepare all Change Orders and submit to the Architect 3 signed copies with full supporting documentation attached to each copy. Architect will sign and forward all copies to the Owner. Owner will sign all copies, retain one copy, and return 2 copies to the Architect. Architect will retain one copy and forward one copy to the Contractor.
B. All Contractor requests for Change Orders shall be submitted to the Architect within two weeks of the requested work. If such Change Order is not issued within this time frame then the request will not be processed by the Owner or Architect and will be completed by the Contractor at no cost to the project.

1.11 CORRELATION

A. Promptly revise the Schedule of Values on the Application for Payment Form by indicating each authorized Change Order as a separate line item and adjusting the Contract Sum as shown on the accepted Change Order.
B. Promptly revise the Progress Schedule to reflect any change in the Contract Time and resubmit.
C. Promptly enter changes in the Project Record Documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01028

SECTION 01030 - ALTERNATES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Requirements and descriptions for Alternates as defined herein and as indicated.

1.03 DEFINITIONS

A. “Alternates” are defined as alternate products, materials, equipment, systems, methods, units of work or major elements of the construction, which may, at the Owner’s option and under the terms established by Bidders’ Instructions and in the Contract or Agreement, be selected for the work in lieu of the corresponding requirements of the Contract Documents. Selection may occur prior to the Contract Date, or may, by the Agreement, be deferred for possible selection at a subsequent date.

1.04 PROCEDURES

A. Include as a part of each alternate, miscellaneous devices, appurtenances, differences in utility or power requirements and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.
B. Immediately following award of Contract, prepare and distribute to each party involved, notification of the status of each alternate. Indicate whether alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to alternates, if any.

1.05 LIMITATIONS

A. The description herein of each alternate is recognized to be incomplete and abbreviated, but requires that each change must be complete for the scope of work affected. Refer to the applicable specification sections (Divisions 2 through 16), and to applicable drawings, for the specific requirements of the work. Coordinate related work and modify surrounding work as required to properly integrate with the work of each alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3- EXECUTION

3.01 SCHEDULE OF ALTERNATES (See bid form)

1. Alternate 1 - Substitute P-Lam for Quartz countertops at Break Room 04 & Copy Center 06
2. Alternate 2 - Substitute Marlite Symmetrix wall panels for porcelain wall tiles at wainscot locations in Restrooms 03A & 09.

END OF SECTION 01030

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Requirements for coordination, supervision and administration for Project, including but not necessarily limited to:
   1. Coordination.
   2. Administrative and supervisory personnel.
   3. General installation provisions.
   4. Cleaning and protection.

1.03 RELATED SECTIONS

A. For descriptions of the work of the entire Project within and outside of the work of this Contract: Section 01010.
B. Section 01200 - Project Meetings.

1.04 SUBMITTALS:

A. Coordination Drawings:
   1. For locations where several elements of equipment, mechanical or combined mechanical and electrical work must be sequenced and positioned with precision in order to fit into the available space, prepare coordination shop drawings showing the actual physical dimensions at accurate scale required for the installation. Prepare and submit coordination drawings prior to purchase/fabrication/installation of any of the elements involved in the coordination.
   2. Lay out the mechanical and electrical work in conformity with the Contract Drawings, coordination drawings and other shop drawings, product data and similar requirements, so that the entire mechanical plant will perform as an integrated system properly interfaced with electrical work and other work.
B. Staff Names:
   1. Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; their addresses and telephone numbers.
   2. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

1.05 GENERAL COORDINATION

A. General:
   1. Each entity involved in the performance of work for the entire Project shall cooperate in the overall coordination of the work; promptly, when requested, furnish information concerning its portion of the work; and respond promptly and reasonably to the decisions and requests of persons designated with coordination, supervisory, administrative, or similar authority.
   2. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
      a. Prepare similar memoranda for the Owner and separate Contractors where coordination of their work is required.
B. Administrative Procedures:
   1. Coordinate scheduling and timing of required administrative procedures with other

construction work. Such administrative activities include, but are not limited to, the following:
a. Preparation of schedules.
b. Installation and removal of temporary facilities.
c. Delivery and processing of submittals.
d. Progress meetings.
e. Project closeout activities.

C. Conservation:
1. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials.
a. Re-cycle construction materials where practicable.

D. Site utilization:
1. In addition to the site utilization limitations and requirements shown on the drawings, and indicated by the Contract Documents, administer the allocation of available space equitably among entities needing access and space, so as to produce the best overall efficiency in the performance of the total work of the project. Schedule deliveries so as to minimize the space and time requirements for storage of materials and equipment on the site; but do not unduly risk delays in the work.

E. Coordination Meetings:
1. Include in scheduled meetings, coordination of various entities and activities as set forth in Section 01200. Where necessary, schedule additional coordination meetings for this purpose on an as- needed basis.

F. Layout:
1. It is recognized that the Contract Documents are diagrammatic in showing certain physical relationships of the various elements and systems and their interfacing with other elements and systems. Establishment and coordination of these relationships is the exclusive responsibility of the Contractor. Do not scale the drawings. Lay out and arrange all elements to contribute to safety, efficiency and to carry the harmony of design throughout the Work. In case of conflict or undimensioned locations, verify required positioning with Architect.

G. Substrate Examination:
1. The Installer of each element of the work must examine the conditions of the substrate to receive the work, dimensions and spaces adjacent, tolerances, interfacing with other elements and services, and the conditions under which the work will be performed, and must notify the Contractor in writing of conditions detrimental to the proper or timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

H. Large and Heavy Equipment:
1. Wherever possible, prearrange for the movement and positioning of large equipment into the building structure, so that enclosing walls and roofs will neither be delayed nor need to be removed.
2. Otherwise, advise Contractor of opening requirements to be maintained for the subsequent entry of large equipment units. Coordinate the movement of heavy items with shoring and bracing, so that the building structure will not be overloaded during the movement and installation.
3. Where equipment or products to be installed on the roof are too heavy to be hand-carried, do not transport across roof deck; position by crane or other device so as to avoid overloading the roof deck.

1.06 COMPLETE SYSTEMS

A. It is the intent of the Contract Documents that all systems, including mechanical and electrical, be complete and functional to provide all incidental items and parts necessary to achieve this requirement.

B. Provide correctly sized power, utilities, piping, drains, services and their connections to equipment and systems requiring them, whether or not specific items are listed in the schedule at the end of this section.

1.07 MECHANICAL/ELECTRICAL/EQUIPMENT COORDINATION

A. GENERAL:
   1. Sequence, coordinate and integrate the various elements of equipment, mechanical work and electrical work so that various systems and mechanical plant will perform as indicated and be in harmony with other work of the building. Neither the Architect or his engineering consultants will supervise the coordination, which is the exclusive responsibility of the Contractor.
   2. Comply with the following requirements:
      a. Install piping, ductwork and similar services straight and true, aligned with other work, close to walls and overhead structure, allowing for insulation, concealed (except where indicated as exposed) in occupied spaces, and out-of-the-way with maximum passageway and headroom remaining in each space.
      b. Install electrical work in a neat, organized manner with conduit and similar services in or parallel with building lines, and concealed unless indicated as exposed.
      c. For all work maintain maximum practical overhead clearance but not less than 8" above ceiling. Where exposed, maintain tight to walls and ceilings.
      d. Arrange all work to facilitate maintenance and repair or replacement of equipment. Locate services requiring maintenance on valves and similar units in front of services requiring less maintenance. Connect equipment for ease of disconnecting, with minimum of interference with other work.
      e. Provide space to permit removal of coils, tubes, fan shafts, filters, other parts which may require replacement.
      f. Locate operating and control equipment and devices for easy access. Furnish access panels where units are concealed by finishes and similar work.
      g. Integrate mechanical work in ceiling plenums with suspension system, light fixtures and other service lines and ductwork.
      h. Give right-of-way to piping systems required to slope for drainage over other service lines and ductwork.
      I. Advise other trades of openings required in their work for accommodation of mechanical and electrical elements. Provide and place sleeves and anchors required in other work.

B. Access Panels
   1. Access panels for concealed valves, controls, dampers, pull boxes and other devices requiring access and located in concealed positions other than above lift-out ceilings will be furnished by Installer of item needing access. Coordinate locations with other trades and with Architect. Locate exact positions for installation under Sections 04200 in masonry, 06100 and applicable Division 9 sections in other materials.

1.08 COMPATIBILITY

A. Provide products and equipment which are compatible with other work requiring mechanical/electrical interface including electrical connections, control devices, water, drain and other piping connections. Verify electrical characteristics, fuel requirements and other interface requirements before ordering equipment and resolve conflicts that may arise.
   1. Make connections to controls directly attached to ducts, piping or equipment with flexible connections.

B. Coordinate equipment, mechanical and electrical work in accordance with the following schedule.

   I = Installer of equipment requiring electrical service
   E= Electrical Installer
   M= Mechanical Installer (Including Plumbing)
   T= Temperature Control Installer
   FP= Fire Protection Installer

ITEM	FURNISHED BY	SET IN PLACE OR MOUNTED BY	POWER WIRED AND CONNECTED BY	CONTROL WIRE AND CONNECTED BY
Other Equipment Motors	I	I	E	-
Mechanical Equipment Motors	M	M	E	-
Magnetic Motor Starters	M	M	E	T
Line Voltage Control wiring	E	E	E	E
Control relays, transformers	T	T	T	T
Temperature control panels and time clocks	T	T	E	T
Low voltage control wiring, controls thermostats, valves, dampers, etc.	T	M	T	T
Motor valves, damper motors, solenoid valves, EP and PE switches, etc.	T	M	T	T
Fire protection (exterior horn and light)	E	E	E	E
Fire/smoke damper motors	M	M	E	E
Fire protection controls (Tamper and flow switch)	FP	FP	E	E
Fire and smoke detectors, for fan shut-down and damper operation (including relays)	E	E	E	E
Pushbutton stations, pilot lights	T	T	E	T
Manual operating switches	E	E	E	E
Fused and unfused disconnect switches and thermal overload switches	E	E	E	-
Temporary heating connection	M	M	E	T
Boiler and water heater controls, boiler burner control panels, internally wired	M	M	E	T

C. All temperature control conduit and wiring will be furnished and installed under the Division 15 subcontract.
D. Division 16 shall furnish and install all conduit and wiring required for power wiring carrying equipment full load amperage to all Division 15 equipment unless shown otherwise.
E. Provide Division 16 with a complete summary list of all Division 15 equipment requiring electric power within 30 days after award of Contract. The list shall summarize equipment power loads, quantities, and locations of equipment and connection points.

F. All starters, other than those in Motor Control Centers shall be furnished under Division 15. All starters furnished under Division 15 shall be complete with three O.L. heaters and shall conform to NEC and NEMA requirements.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 GENERAL INSTALLATION PROCEDURES

A. Inspection of Conditions:
   1. Require the Installer of each major component to inspect both the substrate and conditions under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
      a. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
      b. Recheck measurements and dimensions, before starting each installation.
B. Manufacturer's Instructions:
   1. Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
C. Installation:
   1. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.
   2. Install each component during weather conditions and project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
   3. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.
D. Visual Effects:
   1. Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.
E. Mounting Heights:
   1. Where mounting heights are not indicated, install individual components at standard mounting heights as indicated on the drawings and in the specifications for the particular application indicated. Comply with Americans with Disabilities Act Guidelines. Refer questionable mounting height decisions to the Architect for final decision.

3.02 CLEANING AND PROTECTION

A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at final completion.
B. Clean and maintain completed construction as frequently as necessary through the remained of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

END OF SECTION 01040

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Administrative and procedural requirements for cutting and patching.

1.03 DEFINITION

A. “Cutting-and-patching” is defined to include but is not necessarily limited to the cutting and patching of nominally completed and previously existing work, in order to accommodate construction requirements; and is defined to exclude integral cutting-and-patching during the manufacturing, fabricating, erecting and installing process for individual units of work. Drilling the work to install fasteners and similar operations are excluded from the definition of cutting-and-patching.

1.04 RESPONSIBILITIES

A. Contractor shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the Work or to:
   1. Make its several parts fit together properly.
   2. Uncover portions of the work to provide for installation of ill-timed work.
   3. Remove and replace defective work or work not conforming to requirements of Contract Documents.
   4. Remove samples of installed work as specified for testing.
   5. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

B. Refer to other sections of the specifications for specific cutting-and-patching requirements and limitations applicable to individual units of work.

1.05 SUBMITTALS

A. Proposals for Cutting-and-Patching:
   1. Where approval of procedures for cutting ad patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed.
   2. Description of why cutting-and-patching cannot reasonably be avoided, how it will be performed, how structural elements will be reinforced, products to be used, firms and trades to perform the Work, approximate dates of the Work, and anticipated results in terms of variations from the work as originally completed (structural, operational, visual and other qualitites of significance).
      a. List utilities that will be disturbed or otherwise affected by work, including those that will be relocated and those that will be out-of-service temporarily. Indicate how long utility service will be disrupted.
   3. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
      a. Approval by Architect to proceed with proposed cutting-and-patching does not waive his right to later require complete removal and replacement of work found to be unsatisfactorily cut-and-patched.

1.06 QUALITY ASSURANCE

A. Requirements for Structural Work:
   1. Do not cut-and-patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.
B. Operational and Safety Limitations:
   1. Do not cut-and-patch operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in the manner intended or resulting in decreased operational life, increased maintenance, or decreased safety.
C. Visual Requirements:
   1. Do not cut-and-patch construction exposed on the exterior or exposed in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic quality, or result in visual evidence of the cutting-and-patching. Remove and replace work cut-and-patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use materials that are identical to existing materials. If identical material are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing material.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

3.02PREPARATION

A. Temporary Support:
   1. Provide adequate support for work to be cut, to prevent failure. Do not endanger other work
B. Protection:
   1. Provide adequate protection of other work during cutting-and-patching, to prevent damage; and provide protection of the work from adverse weather exposure.
   2. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
   3. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been make to bypass them.

3.03 CUTTING-AND-PATCHING

A. General:
   1. Employ skilled workers to perform cutting-and-patching. Proceed with cutting-and-patching at the earliest feasible time and complete without delay.
B. Cutting:
   1. Cut work by methods least likely to damage work to be retained and work adjoining. Review proposed procedure with original Installer where possible, and comply with his recommendations.
      a. Cut holes and slots neatly to size required and temporarily cover openings when not in use.

b. In general, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.
c. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
d. Cut through concrete and masonry using cutting machine such as a Carborundum saw or diamond core drill.

2. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
   a. Comply with the requirements of applicable sections of Division 2 where cutting requires excavating and backfilling.
3. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

C. Patching:
1. Patch with seas which are durable and as invisible as possible. Comply with specified tolerances for the work.
   a. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
2. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.
   a. Where a patch occurs in a smooth painted surface, extend final paint coat over the entire unbroken surface containing the patch.
3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
4. Patch, repair or rehang existing ceilings as necessary to provide an even plan surface of uniform appearance.

END OF SECTION 01045

SECTION 01078 - DEFINITIONS AND EXPLANATIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Definitions of certain terms used in the specifications, and explanations of the language, abbreviations thereof, format and certain conventions used in the specification and associated Contract Documents.

1.03 LIMITATIONS OF SCOPE

A. The definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to the extent such definitions or explanations are not stated more explicitly in other provisions of the Contract Documents.

1.04 DEFINITIONS

A. General Requirements: Provisions and requirements of other Division 1 Sections apply to the entire work of the Contract and to other elements of work which are included in the Project.

B. Indicated: The term “indicated” refers to graphic representations, notes or schedules on the drawings, to other paragraphs or schedules in the specifications, and to similar requirements in the Contract Documents. Where terms such as “shown”, “noted”, “scheduled” and “specified” are used, it is to help locate the references, no limitation on location is intended.

C. Directed: Terms such as “directed”, “requested”, “authorized”, “selected”, “approved”, “required”, “accepted”, and “permitted” mean “directed by the Architect”, “requested by the Architect”, and similar phrases. However, no such implied meaning will be interpreted to extend the Architect’s responsibility into the Contractor’s area of construction supervision.

D. Installer: The entity (person or firm) engaged by the Contractor, either as an employee, Subcontractor or lower tier for the performance of a particular construction activity, including installation, erection, application and similar required operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term “experienced”, when used with the term “Installer” means having completed a minimum of 5 successful previous projects similar in size and scope to this Project, and being familiar with the precautions required, and having complied with requirements of the authorities having jurisdiction.

Where the specifications require Installer experience or other qualifications, such requirements apply to the firm and not to its employees or individual members. Where firm ownership has changed after the required experience occurred, Architect and Owner reserve the right to consider the ownership change as invalidating the experience requirements.

E. Specialist: The Specification requires that certain specific construction activities shall be performed by specialist who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and the assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

1. These requirements shall not be interpreted to conflict with the enforcement of the building codes and similar regulations governing the Work. They are also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

F. Trades: The use of certain titles such as “carpentry” is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as “carpenter”. It also does not imply that the requirements specified apply exclusively to tradepersons of that corresponding generic name.

G. Project Site: The space available to the Contractor for the performance of the Work, wither exclusively or in conjunction with others performing other work as part of the Project. The extent of the project site is shown on the drawings, and may or may not be identical with the description of the land upon which the project is to be built.
H. Testing Agency or Laboratory: An independent entity engaged to perform specific inspections or tests of the work, either at the project site or elsewhere; and to report on, and if required, interpret the results of those inspections or tests.
I. Approve: Where used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's responsibilities and duties as specified in the General and Supplementary Conditions. Such approval shall not release the Contractor form responsibility to fulfill requirements of the Contract Documents, unless otherwise provided in the Contract Documents.
J. Regulation: The term "Regulations" includes laws, statutes, ordinances and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the Work.
K. Contractor's Option: Where materials, products, systems or methods are specified to be at the Contractor's option, the choice of which material, method, product or system will be used is solely the Contractor's. There will be no change in Contract Sum or Time because of such choice.
L. Furnish: The term "furnish" is used to mean, "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations".
M. Install: The term "install" is used to describe operations at the project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations".
N. Provide: The term "provide" means "to furnish and install, complete and ready for the intended use".
O. Guarantee: The narrow definition of the term "warranty" is hereby established as applying to both "warranty" and "guarantee" which terms are used interchangeably.

1.05 SPECIFICATION EXPLANATIONS

A. Specification Content Conventions:
   1. In certain circumstances language used in specifications and other Contract Documents is of the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words will be interpreted s singular where applicable and where the full context of the Contract Documents so indicates.
B. Specification Format:
   1. These specifications are organized into Divisions and Sections based on the CSI 16-Division format, generally conforming to CSI "Masterformat" for section titles and numbers.
C. Imperative Language:
   1. Imperative language is used generally in the specifications. Requirements expressed imperatively are to be performed by the Contractor. At certain locations in the text, for clarity, contrasting subjective language is used to describe the responsibilities which must be fulfilled either indirectly by the Contractor or, when so noted, by others.

1.06 DRAWING SYMBOLS

A. Graphic symbols used on mechanical and electrical Drawings are generally aligned with symbols recommended by ASHRAE. Where appropriate, they are supplemented by more specific symbols recommended by technical associates including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Architect for clarification before proceeding.

PART 2 - PRODUCTS (Not applicable)
PART 3 - EXECUTION (Not applicable)

END OF SECTION 01078

SECTION 01090 REFERENCE STANDARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1-Specification sections, apply to work of this section.

1.02 SECTION INCLUDES

A. General information and listing of reference standards.

1.03 REFERENCE STANDARDS

A. Applicability of Standards:
   Except where Contract Documents include more explicit or stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into Contract Documents. Such standards are made a part of the Contract Documents by reference. Individual Sections indicate which codes and standards the Contractor must keep available at the project site for reference.
   Referenced standards take precedence over standards that are not referenced but generally recognized in the construction industry as applicable.

B. Conflicting Requirements:
   Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents indicate otherwise. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Architect for a decision before proceeding.

C. Unreferenced Standards:
   Unreferenced standards are not directly applicable to the Work, except as a general requirement of whether the Work complies with recognized construction industry standards.

D. Publication Dates:
   Where compliance with an industry standard is required, comply with standard in effect as of date of Contract Documents.
   Updated Standards: At the request of the Architect, Contractor or authority having jurisdiction, submit a Change Order proposal where an applicable code or standard has been revised and reissued after the date of the Contract Documents and before performance of Work affected. The Architect will decide whether to issue a Change Order to proceed with the updated standard.

E. Copies of Standards:
   Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activities. Copies of applicable standards are not bound with the Contract Documents.
   Where copies of standards are needed for proper performance of a recognized construction activity, the Contractor shall obtain copies directly from the publication source.
   Although copies of standards needed for enforcement of requirements may be part of required submittals, the Architect reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.

1.04 ABBREVIATIONS

A. Trade Associations, Standards and Abbreviations:
   References in the Contract Documents to publications and recommendations, by either acronym, name or abbreviation, include but are not necessarily limited to the following

trade associations, technical societies, government agencies, recognized authorities and standards:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway & Transportation Officials
AATCC	American Association of Textile Chemists & Colorists
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ADA	Americans with Disabilities Act
ADC	Air Diffusion Council
AFBMA	Anti-Friction Bearing Manufacturer’s Association
AGA	American Gas Association
AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AI	The Asphalt Institute
AIA	The American Institute of Architects
A.I.A.	American Insurance Association
AIHA	American Industrial Hygiene Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALI	Associated Laboratories
ALSC	American Lumber Standards Committee
AMCA	Air Movement & Control Association
ANSI	American National Standards Institute
APA	American Plywood Association
A.P.A.	American Parquet Association
API	American Petroleum Institute
ARI	Air Conditioning and Refrigeration Institute
ARMA	Asphalt Roofing Manufacturer's Association
ASA	Acoustical Society of America
ASC	Adhesive and Sealant Council
ASHRAE	American Society of Heating, Refrigeration & Air conditioning Engineers
ASME	American Society of Mechanical Engineers
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWI	Architectural Woodwork Institute
AWPA	American Wood Preserver's Association
AWPB	American Wood Preserver's Bureau
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders' Hardware Manufacturer's Association
BIA	Brick Institute of America
BIFMA	Business & Institutional Furniture Manufacturer's Association
CAGI	Compressed Air & Gas Institute
CDA	Copper Development Association
CE	Corps of Engineers (U.S. Dept. of the Army)
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CAUS	Color Association of the United States
CBM	Certified Ballast Manufacturers Association
CISCA	Ceiling and Interior Systems Contractors Association

CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPSC	Consumer Products Safety Commission
CRI	The Carpet and Rug Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard (U.S. Dept. of Commerce)
CSI	The Construction Specification Institute
CTI	Ceramic Tile Institute
CSSB	Cedar Shake and Shingle Bureau
DHI	Door and Hardware Institute
DLPA	Decorative Laminate Products Association
DOC	Department of Commerce
DOT	Department of Transportation
ECSA	Exchange Carrier's Standards Association
EIA	Electronic Industries Association
EIMA	Exterior Insulation Manufacturer's Association
EJMA	Expansion Joint Manufacturer's Association
EPA	Environmental Protection Agency
ETL	ETL Testing Laboratories, Inc.
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FCI	Fluid Controls Institute
FGMA	Flat Glass Marketing Association
FHA	Federal Housing Administration (U.S. Dept. of HUD)
FM	Factory Mutual Engineering and Research
FPL	Forest Products Laboratory (U.S. Dept. of Agriculture)
FS	Federal Specification (General Services Admin.)
FTI	Facing Tile Institute
GA	Gypsum Association
GSA	General Services Administration
HEI	Heat Exchange Institute
HI	Hydronics Institute
H.I.	Hydraulic Institute
HMA	Hardwood Manufacturer's Association
HPMA	Hardwood Plywood Manufacturer's Association
HUD	Housing and Urban Development
IBD	Institute of Business Development
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineer's Association, Inc.
IEC	International Electrotechnical Commission (available from ANSI)
IEEE	Institute of Electrical & Electronic Engineers
IESNA	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
ILI	Indiana Limestone Institute of America
IMI	International Masonry Institute
IMSA	International Municipal Signal Association
IRI	Industrial Risk Insurers
ISA	Instrument Society of America
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturer's Association
MCAA	Mechanical Contractors' Association of America
MFMA	Maple Flooring Manufacturer's Association
MIA	Marble Institute of America
MIL	Military Standardization Documents (U.S. Dept. of Defense)
ML/SFA	Metal Lath/Steel Framing Association
MRCA	Midwest Roofing Contractors' Association
MSS	Manufacturer's Standardization Society of the Valve & Fitting Industry

NAAMM	The National Association of Architectural Metal Manufacturers
NAPA	National Asphalt Pavement Association
NAPF	National Association of Plastic Fabricators (Now DLPA)
NBGQA	National Building Granite Quarries Association
NBHA	National Builders Hardware Association (Now DHI)
NBS	National Bureau of Standards (U.S. Dept. of Commerce)
NCMA	National Concrete Masonry Association
NCRPM	National Council on Radiation Protection and Measurement
NEC	National Electrical Code by NFPA
NECA	National Electrical Contractors Association
NEII	National Elevator Industry, Inc.
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
N.F.P.A.	National Forests Products Association
NHLA	National Hardwood Lumber Association
NIST	National Institute of Standards and Technology
NKCA	National Kitchen Cabinet Association
NLGA	National Lumber Grades Authority
NOFMA	National Oak Flooring Manufacturers Association
NPA	National Particleboard Association
NPCA	National Paint & Coating Association
NRCA	National Roofing Contractor's Association
NSF	National Sanitation Foundation
NSPE	National Society of Professional Engineers
NSSEA	National School Supply & Equipment Association
NTMA	The National Terrazzo and Mosaic Assoc.
NWMA	National Woodwork Manufacturers Association (Now NWWDA)
NWWDA	National Wood Window & Door Association (formerly NWMA)
OSHA	Occupational Safety & Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDI	Plumbing & Drainage Institute
PEI	Porcelain Enamel Institute
PS	Product Standard of NBS (U.S. Dept. of Commerce)
RFCI	Resilient Floor Covering Institute
RIC	Roof Insulation Committee
RIS	Redwood Inspection Service
RMA	Rubber Manufacturer's Association
SAMA	Scientific Apparatus Makers Association
SDI	Steel Deck Institute
S.D.I.	Steel Door Institute
SGCC	Safety Glazing Certification Council
SIGMA	Sealed Insulating Glass Manufacturer's Assoc.
SJI	Steel Joist Institute
SMACNA	Sheet Metal & Air Conditioning Contractor's Nat'l. Assoc.
SPIB	Southern Pine Inspection Bureau
SPRI	Single Ply Roofing Institute
SSPC	Steel Structures Painting Council
SWI	Steel Window Institute
TCA	Tile Council of America, Inc.
TIMA	Thermal Insulation Manufacturer's Association
UBC	Uniform Building Code
UL	Underwriters' Laboratories, Inc.
USDA	United States Department of Agriculture
USPS	United States Postal Service
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Wall Covering Manufacturer's Association

WRI	Wire Reinforcing Institute
WSC	Water Systems Council
WSFI	Wood and Synthetic Flooring Institute
WWPA	Western Wood Products Association (Grading Rules)
W.W.P.A.	Woven Wire Products Association

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01090

SECTION 01105 - ADMINISTRATION, PROCEDURES, CODES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. General administrative requirements and procedures and related applicable codes.

1.03 CODES

A. Obtain all permits, inspections, approvals, and certificates required by law. Conform to all laws, ordinances, rules and regulations applicable to the location of the Project.

1.04 REGULATIONS

A. In addition to the above, conform to the following standards and regulations:
B. Obtain copies of the following regulations and retain at the Project site, available for reference by parties who have a reasonable need for such reference.
   1. International Building Code with local amendments 2018;
   2. International Plumbing Code with local amendments 2018;
   3. International Mechanical Code with local amendments 2018;
   4. International Fuel and Gas Code with local amendments 2018.
   5. International Fire Code with local amendments 2018
   6. National Electric Code with local amendments 2020.
   7. Life Safety Code, NFPA 101
   8. Federal Standards and Regulations:
      a. Americans with Disabilities Act (ADA), July 26, 1991
   9. Local Department of Health including but not limited to:
      a. Colorado Primary Drinking Water Regulations
      b. Water Quality - Cross Connection Control
      c. Asbestos
      d. Hazardous Materials
   10. ANSI/A117.1 2009- Providing Accessibility and Usability for Physically Handicapped People
   11. Other specific standards and regulations as specified in the individual sections when specified to be available at the site.
C. Publication Dates:
   1. Comply with codes and standards in effect at the date of the Contract Documents, except where a standard of a specific date or edition is indicated.

1.05 EXISTING UTILITIES

A. The existence and location of underground utilities and construction indicated as existing are not guaranteed.
B. Before starting any work disturbing, moving or penetrating the ground, call the Utility Notification Center of Colorado, 534-6700, to locate, stake and identify depth of all buried utilities within the construction limits. Obtain location information for water and sewer lines from the appropriate entity.

1.06 SURVEYS, LAYOUTS, LEVELS

A. General:
   1. Working from lines and levels established by the property survey, establish and maintain

bench marks and other dependable markers to set the lines and levels for the work at each story of construction and elsewhere on the site as needed to properly locate every element of the work of the entire project.
   a. As construction proceeds, check every major element for line, level and plumb.
2. Calculate and measure required dimensions as shown within recognized tolerances. Do not scale the drawings to determine dimensions. Advise entities engaged in construction activities of the marked lines and levels provided for use.
3. Record deviations from the required lines and levels, and advise the Architect promptly upon detection of deviations exceeding indicated or recognized tolerances. Record deviations which are accepted (not corrected) on the record drawings. Refer to Section 01720 for record drawing requirements.

B. Site Improvements:
1. Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

C. Building Lines and Levels:
1. Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels and control lines and levels required for mechanical and electrical Work.

D. Basic Layout:
1. The Contractor will locate and maintain positions for building corners and primary wall lines for all entities engaged in construction and will establish final grading control levels. All other layouts, grade stakes and levels required for the Work are the responsibility of each Installer.

E. Layout Procedures:
1. Verify layout information shown on the drawings, in relation to the property survey and existing bench marks, before proceeding with the layout of the actual work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
   a. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.
   b. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.
2. Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.
   a. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
3. As the work proceeds, maintain an accurate surveyor's log or record book of such checks, available for the Architect's reference at reasonable times.

1.07 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Furnish Construction Schedule, not less than 4 copies.
1. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
2. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
3. Coordinate the Contractor's construction schedule with the schedule of values list of subcontractors, submittal schedule, progress reports, payment requests and other schedules.
4. Indicate completion in advance of the date established for Final Completion. Indicate Final Completion on the schedule to allow time for the Architect's procedures necessary for certification of Final Completion.

1.08 CRITICAL PATH SCHEDULE

A. Submit within 30 days of the date established for commencement of the Work, a critical path network showing each unit of work broken down in sufficient detail to meet network logic and actual project conditions giving early and late starts for each unit, the critical path, and corrected for normal weather delays and plotted on calendar time. Present in graphic form. Include latest dates for decisions for work specified by allowance, selection of colors, finishes, etc.
B. These critical path diagrams and printouts shall be prepared by persons skilled and experienced in this technique and who use computer facilities to prepare the schedule; all subject to the acceptance by the Owner and the Architect.

1.09 UPDATING

A. The schedules shall be updated and reissued monthly and shall reflect actual job progress, delays or gains of time and any rescheduling. The original schedule and each updating shall be furnished in 4 copies, one to the Owner and three tot he Architect. All costs for this scheduling shall be borne by the Contractor. Submit Architect's copies as part of each pay request which will not be processed without such updates.
    1. When schedule revisions affect the submittals schedule, revise that schedule and submit to Architect with revised Construction Schedule.

1.10 DELIVERY, STORAGE AND HANDLING

A. Properly carton, crate, cover and protect materials, products and equipment for shipping, handling and storing. Use appropriate means for hoisting and loading which will prevent damage or overstress to items being handled or shipped. Store them under roof in controlled environment whenever feasible otherwise store off the ground under suitable coverings properly secured against wind and weather. Protect all items from rain, snow, moisture, wind, cold, heat, frost, sun, staining, discoloration, deterioration and physical damage from any cause. Refer to individual sections for specific requirements.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01105

SECTION 01200 - PROJECT MEETINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Administrative and procedural requirements for project meetings in the following categories:
   1. Pre-construction meeting.
   2. Progress and Coordination meetings.
   3. Pre-installation conferences.
   4. Specially called meetings.

1.03 REQUIREMENTS

A. Owner shall schedule and administer pre-construction meeting. Contractor shall schedule and administer periodic progress meetings, coordination meetings, pre-installation conferences and specially called meetings through-out progress of the work following Owner's meeting outline including the following:
   1. Prepare agenda for meetings.
   2. Distribute written notice of each meeting four days in advance of meeting date.
   3. Make physical arrangements for meeting.
   4. Preside at meetings.
   5. Record the minutes; include significant proceedings and decisions.
   6. Reproduce and distribute copies of minutes within three days after each meeting and send to:
      a. Participants in the meeting.
      b. Parties affected by decisions made at the meeting.
      c. Architect
      d. Owner (2 copies).

B. Representatives of Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

C. Architect may attend meetings to ascertain that Work is expedited consistent with Contract Documents and construction schedules.

1.04 PRE-CONSTRUCTION MEETINGS

A. Schedule within 15 days after date of Notice to Proceed, at a central site location designated by the Contractor and convenient for all parties.

B. Attendance:
   1. Owner's Representative.
   2. Architect and his professional consultants.
   3. Contractor and Contractor's Superintendent.
   4. Major Subcontractors.
   5. Major Suppliers and manufacturers.
   6. Others as appropriate.

1.05 SUGGESTED AGENDA

A. Discuss items of significance that could affect progress including such topics as:
   1. Tentative construction schedule.
   2. Critical Work sequencing.
   3. Designation of responsible personnel.

4. Procedures for processing field decisions and Change Orders.
5. Procedures for processing Applications for Payment.
6. Distribution of Contract Documents.
7. Submittal of Shop Drawings, Product Data and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Office, Work and storage areas.
11. Equipment deliveries and priorities.
12. Safety procedures.
13. First aid.
14. Security.
15. Housekeeping
16. Working hours.

B. Administrative procedures and documents as required by the Owner.

1.06 PROGRESS AND COORDINATION MEETINGS

A. The Contractor will schedule weekly job progress and coordination meetings at the site. Subcontractors or their representatives may be required to attend and may not start their work at the site without having first attended a prior coordination meeting.

B. Attendance:
1. Contractor
2. Subcontractors as appropriate to the agenda and agreed upon by Owners and Architect.
3. Suppliers as appropriate to the agenda.
4. If needed, Architect and his professional consultants but not for matters that are the Contractor's responsibility.
5. Others.

C. Suggested Agenda:
1. Review, approval of minutes of previous meeting.
2. Review of work progress since previous meeting.
3. Field observations, problems, conflicts.
4. Problems which impede Construction Schedule.
5. Review of off-site fabrication, delivery schedules.
6. Corrective measures and procedures to regain projected schedule.
7. Revisions of Construction Schedule.
8. Progress, schedule, during succeeding work period.
9. Coordination of schedules.
10. Review submittal schedules; expedite as required.
11. Maintenance of quality standards.
12. Pending changed and substitutions.
13. Review proposed changes for:
    a. Effect on Construction Schedule and on completion date.
    b. Effect on other contracts of the Project.

1.08 PRE-INSTALLATION CONFERENCES

A. Conduct pre-installation conferences at the site for those installations, systems or assemblies where required by the Specifications or where deemed necessary by the Contractor. The 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 the Architect of scheduled meeting dates.

B. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference.

C. Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.

D. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.
E. In addition to the above, schedule and conduct a pre-construction conference to review the detailed quality control and construction requirements for each of the material and/or systems listed below, not less than ten working days prior to commencement of the applicable portion of the work:
   1. Foundations
   2. Structural steel
   3. Metal deck
   4. Masonry
   5. Roofing
   6. Mechanical and electrical items indicated in Division 15 and 16 sections.
F. Require responsible representatives of each party concerned with that portion of the work to attend the conference, including but not limited to the following:
   1. Contractor's superintendent
   2. Materials supplier(s) or fabricator
   3. Installation subcontractor(s)
   4. Agency responsible for Contractor furnished testing

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01200

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Administrative and procedural requirements for submittal and review of product data, shop drawings, samples and similar items required by the specifications.

1.03 ADMINISTRATIVE SUBMITTALS

A. Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
   1. Schedules.
   2. Permits.
   3. Applications for payment.
   4. Performance and payment bonds.
   5. Insurance certificates.
   6. List of Subcontractors.
   7. Schedule of Values.
   8. Inspection and test results.
   9. Closeout documents.
   10. Coordination drawings.

A. Such submittals are for information and record and do not require action on the part of the Architect except where not in conformity with the Contract Documents. If such non-conformity is observed the Architect will notify the Contractor within two weeks of receipt of document. Failure to observe or notify by the Architect does not relieve Contractor of compliance with Contract Documents.

1.04 SUBMITTAL PROCEDURES

A. General:
   1. Make submittals from Contractor to the Architect **after Contractor has reviewed and stamped each submittal and indicted the action thereon except for samples and selection submittals.** Contractor shall carefully review and coordinate all work. Unreviewed submittals will be returned until properly reviewed and coordinated.
   2. Any deviations from the contract documents shall be highlighted and brought to the attention of the Design Team. Failure to do so by the Contractor can result in the material/ product being removed at no cost to the Owner.

B. Coordination:
   1. **Submittals are to be issued to the architect as an electronic copy. Color and material samples are to be issued to the architect and will then be returned to the General Contractor as an electronic copy.**
   2. Coordinate the preparation and processing of submittals with the performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
      a. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
      b. **Coordinate long lead submittals with contractors schedule.**
      c. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for

coordination.
1. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing:
1. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
a. Allow 3 weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will advise the Contractor when a submittal being processed must be delayed for coordination.
b. If an intermediate submittal is necessary, process the same as the initial submittal.
c. Allow 2 weeks for reprocessing each submittal.
d. No extension of Contract time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
e. The Contractor may only submit three (3) submittals to the Architect at one time for processing. Any additional submittal beyond the indicated (3) will be returned to the Contractor as Rejected and submit at later date per contractor requirements.

D. Submittal Preparation:
1. Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
a. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
b. Include the following information on the label for processing and recording action taken.
1. Project name.
2. Date.
3. Name and address of Architect.
4. Name and address of Contractor.
5. Name and address of Subcontractor.
6. Name and address of Supplier.
7. Name of manufacturer.
8. Number and title of appropriate Specification Section.
9. Drawing number and detail references, as appropriate.

E. Sumittal Transmittal:
1. Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
a. On the transmittal record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.05 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
1. Dimensions.
2. Identification of products and materials included.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurements.

C. Submit initially, one correctable, translucent, reproducible print and one blue- or black-line print each for Architect, and where applicable, the Consulting Engineer.

D. Contractor will provide prints of marked up sepia as may be required for his use and that of his Subcontractors and suppliers.
1. Final submittal shall be delivered to the Architect with sufficient copies so that desired

distribution can be made by Contractor, one copy each to the Owner, the Architect, his consulting engineer where applicable, the Contractor's field office, his home office, the Record Documents, the fabricator, and any others involved in the submittal.

E. If initial submittal becomes final submittal, provide sufficient additional copies that may be needed to meet these requirements.
F. Where shop drawings are indicated to be submitted for "information only", submit three sets of prints to Architect and retain one set for Project Record Documents.

1.06 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, rough-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specifically prepared because standard printed data is not suitable for use, submit as "Shop Drawings".
   1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
      a. Manufacturer's printed recommendations.
      b. Compliance with recognized trade association standards.
      c. Compliance with recognized testing agency standards.
      d. Application of testing agency labels and seals.
      e. Notation of dimensions verified by field measurements
      f. Notation of coordination requirements.
   2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
B. Submittal is for information and record, unless otherwise indicated; and therefore, initial submittal is final submittal unless returned promptly by the Architect marked with an "action" which indicates an observed noncompliance.
C. Submit copies as above specified for final shop drawings. Where applicable, include additional copies for maintenance manuals. Submit a covering letter to show Contractor's review and action.

1.08 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identicial with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
   1. Mount, display or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:
      a. Generic description of the Sample.
      b. Sample source.
      c. Product name or name of manufacturer.
      d. Compliance with recognized standards.
      e. Availability and delivery time.
B. Submit Samples to Architect who will review them solely for kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
   1. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.

1.09 PRELIMINARY SUBMITTALS

A. Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

1.10 SUBMITTALS

A. Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
B. Maintain sets of samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
   1. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
   2. Sample set may be used to obtain final acceptance of construction associated with each set.

1.11 DISTRIBUTION OF SAMPLES

A. Prepare and distribute additional sets to Subcontractors, manufacturers, fabricators, suppliers, Installers, and others as required for performance of the Work. Show distribution on transmittal forms.

1.12 FIELD SAMPLES AND MOCK-UPS

A. Field Samples and mock-ups specified in individual Sections are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.
   1. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.13 SELECTION SUBMITTAL

A. Where selections of color, patterns, textures are specified to be made by the Architect, assemble complete samples of all specified or approved products for all specification sections and submit to Architect. Review specifications and assemble all such samples for a combined single submittal. Indicate on the transmittal the latest date for selections to be made for each item to permit delivery of material in accordance with Progress Schedule. Architect's action is limited solely to the specified selections or rejection of submittal items not in accordance with Specifications.

1.14 INSPECTION AND TEST REPORTS

A. Where standard tests are specified for products, including equipment, which tests are not performed at the job site, follow procedures for Product Data. For field inspection and tests specified to be performed by independent agencies, such agencies shall transmit directly one copy each to the Architect, his consulting engineer where applicable, and the Contractor with an extra copy of Record Documents.

1.15 TEST REPORT SUBMITTAL

A. Distribute one copy of test reports by the testing agency as follows:
   1. General Contractor's Project Manager
   2. General Contractor's Field superintendent
   3. Owner
   4. Applicable engineer
   5. Architect
   6. Other copies as directed.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01300

SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.

B. See Division 1 Section "Closeout Procedures" for submitting digital media as Project Record Documents at Project closeout.

1.02 SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate location of construction. Include same label information as corresponding set of photographs.

B. Construction Photographs:
1. Digital Images: Submit a complete set of digital image electronic files as a Project Record Document on CD-ROM. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

C. Preconstruction Photographs:
1. Digital Images: Submit a complete set of digital image electronic files of existing conditions onsite and offsite. Take special care to photograph existing roadways, sidewalk, and drainage structures.

1.03 COORDINATION

A. Auxiliary Services: Cooperate with video photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs without obscuring shadows.

1.04 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from video photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

D. Digital Images: Provide images in uncompressed JPEG format, produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than 1024 by 768 pixels.

PART 2 - EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in filename for each image.

C. Periodic Construction Photographs: Take 12, digital photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

END OF SECTION 01322

SECTION 01500 - TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Minimum requirements for temporary services, utilities and facilities. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication by Architect that such temporary activity is not required for successful completion of the work. The use of alternative facilities equivalent to those specified is the Contractor's option, subject to Architect's acceptance.
   1. Except as otherwise indicated, the costs of providing and using temporary utility services are included in the Contract Sum.

1.03 QUALITY ASSURANCE

A. Standards:
   1. Comply with governing regulation, industry standards and utility company regulations and recommendations including, but not necessarily limited to, code compliance, permits, inspections, testing, and health, safety, fire, pollution and environmental compliance.
   2. Comply with NFPA Code 241 "Building Construction and Demolition Operations", ANSI A10 Series and NECA Electrical Design Library "Temporary Electrical Facilities".
      a. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
      b. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

1.04 DEFINITIONS

A. Cold Weather Protection: Is defined as all heating required during construction period prior to enclosure of the buildings.
B. Temporary Heat: Is defined as all heating required after enclosure of the buildings or floors. A building or floor is closed in when it is roofed and such protection at doorways, windows, and other openings as will provide a reasonable heat retention is provided. Use of permanent equipment is subject to provisions of Division 15.

1.05 TEMPORARY UTILITIES

A. Engage the appropriate local utility company to install temporary service or connect to existing service and provide temporary meter. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
   1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.

1.06PROJECT CONDITIONS

A. Scheduled Uses:
   1. Provide temporary facilities and services at the time first needed at the site; and maintain, expand and modify the facilities as needed throughout the construction period and do not remove until no longer needed. At the earliest feasible time, and when acceptable to the

Owner, change over from the use of temporary utility service to permanent service.

B. Temporary Use of Permanent Facilities:
   1. Regardless of assigned responsibility for initial installation of a temporary facility, the primary Installer of the corresponding permanent facility shall assume responsibility for its operation, maintenance and protection during use as a temporary facility prior to the Owner's acceptance and assumed operation of the facility.

C. Conditions of Use:
   1. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Provide either new or used materials and equipment for temporary facilities, which are in substantially undamaged and serviceable condition. Provide types and qualities which are recognized in the construction industry as suitable for the intended use in each application.
   1. Comply with the requirements of Section 06100 for temporary facilities using carpentry materials.

PART 3 - EXECUTION

3.01 GENERAL

A. Use qualified workers for the installation of temporary facilities. Locate facilities where they will serve the Project adequately, and result in minimum interference with performance of the work. Locate field offices for easy access to and observation of the construction work.

3.02TEMPORARY FACILITIES BY CONTRACTOR

A. Field Offices:
   1. Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings.

B. Storage and Fabrication Facilities: (For work not subcontracted)
   1. Install individual trailers or sheds as required to accommodate the work; sized, furnished and equipped properly including temporary utilities as needed.

C. Sanitary Facilities:
   1. Comply with governing regulations including safety and health codes for the type, number, location, operation and maintenance of fixtures and facilities, but provide not less than the specified requirements. Install sanitary facilities in available locations which will best serve the needs of personnel at the project site.
      a. Provide temporary toilets as required.
      b. Distribute toilets and drinking water fixtures so that no one within the construction area will need to walk more than 200' horizontally to reach the facilities.
      c. Supply and maintain toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each sanitary facility, and provide appropriate waste paper containers for used materials.
   2. Toilets: Use of the Owner's existing facilities is not permitted.
   3. Wash Facilities: Install wash facilities supplied with portable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each

condition.

4. Drinking Water: Supply drinking water for construction personnel by drinking fountains connected to water system or by containerized tap dispensers with paper cups.

D. Project Identification and Temporary Signs:
   1. Prepare project identification sign(s) at location(s) indicted or as directed. Support and install signs on suitable posts and framing of treated wood or steel. Maintain signs throughout the construction period. Do not permit installation of unauthorized signs.
   2. Project Identification Sign(s): Engage an experienced sign painter to apply the required graphics, in a neat and professional manner.
      a. Provide project identification sign of 32 sq. ft. Area, colors and lettering as later detailed, indicating name of Project, Owner, Owner's logo, Architect, Contractor, contract amount, source of funding, start and completion dates.

E. Temporary Telephones:
   1. Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period. Pay for service except for toll calls which will paid for by party making such calls.
   2. Include as part of the telephone system a telephone answering machine and facsimile machine with adequate paper supply.

F. Thermometer:
   1. Install an official project outdoor thermometer, in a shaded-from-the-sun, conveniently readable location, which will give reasonable accurate readings of the actual temperatures, and which can be reached easily for resetting. Instrument: Re-settable type indicting daily maximum and minimum temperatures. Keep a permanent daily log of those readings.

G. Walks:
   1. Install and maintain temporary walkways around the construction work and to offices, toilets and similar places at the site.

I. Temporary Enclosures:
   1. Provide temporary enclosure for protection of construction in progress and completed from exposure, foul weather, other construction operations and similar activities.
   2. Provide temporary enclosure wherever temporary heat is needed and permanent building enclosure is not yet completed nor adequate for the containment of temporary heat.
   3. Coordinate temporary enclosures with ventilating and material drying or curing requirements to avoid dangerous conditions and deleterious effects.
   4. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

J. Barricades, Warning Signs and Lights: (For work not subcontracted)
   1. Comply with standards and code requirements for the erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

K. Enclosure Fence:
   1. When excavating begins, install an enclosure fence with locked entrance gates.
   2. Locate to enclose the portion of the site determined by the Contractor to be sufficient to accommodate his construction operations for each of the phases and as acceptable to the Owner. Provide open mesh galvanized fencing as acceptable to Architect, 6 ft. height.

L. Heating During Construction:
   1. Cold Weather Protection: Provide such heat and fuel, heating units, equipment as necessary to protect the work for damage due to cold. Maintain equipment and surroundings in a clean, safe condition.
   2. Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
   3. Provide temporary heat as necessary to heat enclosed spaces to the temperatures described below:
      a. Except as otherwise specified, maintain a minimum temperature of 50 degrees, and a

maximum temperature of 78 degrees. At all times during the placing, setting, and curing of plaster, drywall and ceramic tile, provide sufficient heat to produce a uniform temperature in the spaces involved of not less than 55 degrees. Before, during and through the placing of wood finish and the application of other interior finishing, varnishing, painting, etc., and until final acceptance of the work, provide sufficient heat to produce a temperature of not less than 60 degrees.

b. Include power and operating costs.

M. Heating Facilities:
   1. Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
      a. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
   2. Ventilation: Provide such temporary ventilation as may be required to prevent hazardous accumulation of fumes, remove excess humidity, ventilate sanitary facilities and storage spaces for volatile and hazardous materials.

N. Miscellaneous Facilities:
   1. Provide ladders, ramps, temporary stairs, for access to all levels of the construction for general access by all trades. Individual contractors and subcontractors will furnish their own stepladders, scaffolds, staging, work platforms and other facilities for use of their workers and as necessary to the expeditious completion of their work. Provide waste chutes as required by applicable laws and regulations.

O. Temporary Fire Protection:
   1. Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 “Standard for Portable Fire Extinguishers”, and NFPA 241 “Standard for Safeguarding Construction, Alterations and Demolition Operations”.
      a. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
      b. Store combustible materials in containers in fire-safe locations.
      c. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
      d. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

P. Protection of Existing Trees and Vegetation:
   1. Protect existing trees and other vegetation indicated to remain in place, against damage to roots, trunks or branches. Do not stockpile construction materials or excavated materials within drip line. Provide temporary guards to protect trees and vegetation to be left standing.
   2. Water trees and other vegetation to remain within the limits of the contract work as required to maintain their health during the course of construction operations.
   3. Repair or replace trees and vegetation damaged by construction operations, in a manner acceptable to the Architect. Use a qualified tree surgeon to repair tree damage.

Q. Protection of Work:
   1. The Contractor shall obtain the advice and recommendations of his installers for procedures to protect their work. Installers are responsible for protecting their work and that of other trades while working at the job-site or in an area thereof. When the Installer is no longer working in the area or at the job, the Contractor shall provide protective measure and materials to assure that each element will be without damage or deterioration (other than normal weathering for exterior exposed materials) throughout the remainder of the construction period up to the date of final completion. Remove protective coverings and materials at the appropriate time but no later than final cleaning operations.
   2. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings. Protect finished floors and stairs from traffic, movement of heavy objects, and storage.
   3. Prohibit traffic and storage on waterproofed and roofed surfaces, on lawn and landscaped areas.
   4. Always protect excavation, trenches, and building, from damage from rain water, spring

water, ground water, backing up of drains or sewers Provide pumps, equipment, enclosures, to provide this protection.

R. Security:
   1. Provide security program and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, and theft. Coordinate with Owner's security program.
   2. Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrance to prevent unauthorized entrance, vandalism, theft and similar violations of security.
      a. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
      b. Sufficient 220v outlets for special tools and similar devices requiring such services at locations where required.
      c. Sufficient circuits and duplex 120v single phase outlets so located that any part of the work can be reached with a 75 ft. extension cord to accommodate normal power tools and supplemental lighting.
      d. Temporary light to levels and as required by governing regulations but not less than minimum 5 footcandle illumination in all areas accessible to workers during hours they are at he job; minimum 10 footcandle's for shop areas; 20 footcandle's or more where detailed or finishing work is being done, supplemented as may be required.
      e. Provide additional exterior and interior lighting as required for warning, public safety, and project security.
   3. Contractor and each Subcontractor furnishes his own extension cords for power as required by him. Electric Utility power charges will be paid by Owner.
   4. Where permanent light fixtures have been used for temporary lighting, all lamps shall be operable and all fixtures shall be in a clean state and any burned out lamps will be replaced prior to final completion.

3.03 FACILITIES BY SUBCONTRACTORS REQUIRING THEM

A. Storage and Fabrication Facilities:
   1. Install individual trailers or shed as required to accommodate the work; sized, furnished and equipped properly including temporary utilities as needed.
      a. Sizes, quantities and locations are under control of Contractor.

B. Barricades, Warning Signs and Lights:
   1. Comply with standards and code requirements for the erection of structurally adequate barricades.
   2. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

C. Cold Weather Protection:
   1. Provide such heat and fuel, heating units, equipment as necessary to protect the work from damage due to cold. Maintain equipment and surroundings in a clean, safe condition.

3.04 OPERATIONS AND TERMINATIONS

A. Supervision:
   1. Enforce strict discipline in the use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Janitorial Services:
   1. Provide weekly janitorial services for temporary office, toilets, wash facilities, and similar areas at the project site. Require users of other temporary facilities to maintain clean and orderly premises.

C. Maintenance:
   1. Installing entity shall maintain temporary facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

a. Maintain operation of temporary enclosures, heating, cooling, humidity control ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
b. Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

D. Termination and Removal:
1. At the time the need has ended for each temporary facility, or when it has been replaced by authorized use of a permanent facility, or at the time of Final Completion, promptly remove the facility unless requested by the Architect to be retained for a longer period of time.
2. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged work, clean exposed surfaces and replace construction which cannot be satisfactorily repaired.
3. Materials and facilities that constitute temporary facilities are the property of the installing entity.

END OF SECTION 01500

SECTION 01561 - CONSTRUCTION CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Facilities, equipment and labor for cleaning and waste disposal during construction. Refer to Section 01710 for final cleaning.

1.03 RESPONSIBILITIES

A. General:
   1. Contractor and each Subcontractor and Installer is responsible for specific cleaning operations of his work to the extent specified in the appropriate specification sections.

B. Pollution Control:
   1. Conduct clean-up and disposal operations to comply with applicable anti-pollution laws and local ordinances.
      a. Burning or burying of waste materials on the project site is not permitted.
      b. Disposal of volatile fluids and wastes in storm or sanitary sewers, or into streams or waterways is not permitted.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS

A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 WASTE DISPOSAL

A. Collection and Disposal of Wastes:
   1. Establish and enforce a daily system for collecting and disposing of waste materials from construction areas and elsewhere at the project site. Provide suitable trash containers at a central collection point on the site. Provide chutes or other suitable means for removing trash safely and cleanly from elevated portions of the work.
      a. Comply with NFPA 241 for removal of combustible waste material and debris.
   2. Contractor and each Subcontractor and Installer is responsible for cleaning and removal of his trash and debris to this collection point.
   3. Do not hold collected materials at the site for periods of more than 7 days. Handle hazardous, dangerous or unsanitary wastes separately from other waste materials, by containerizing properly. Dispose of each category of waste material in a lawful manner. Do not bury or burn waste materials on the Owner's property.
      a. Enforce strict prohibition against the washing waste material down sewers or into waterways.
   4. Waste concrete and masonry shall be removed from the site and legally disposed of by masonry and concrete installers.

3.02 CLEANING UP

A. Cleaning and Protection of Work:
   1. At the time each unit of work or element of the construction is completed substantially in each area of the Project, clean the unit or element to a condition suitable for occupancy and use as intended, and restore minor or superficial damage. Replace units and elements which are damaged beyond successful restoration.
   2. Where subsequent construction activities could result in damage to other work place and provide appropriate protective covering or other provisions.
   3. Repeat cleaning and protection operations during remainder of construction period, wherever work might otherwise be damaged by sustained soiling or exposure.

B. During Construction:
   1. Oversee cleaning and ensure that building, grounds, and public properties are maintained free from accumulation of waste materials and rubbish.
   2. Take measures to prevent spread of trash, debris, cartons, packaging or other waste materials on or off the Project Site by wind.
   3. Sprinkle dusty debris with water.
   4. At reasonable intervals during progress of work, cleanup site and access and dispose of waste materials, rubbish and debris.
   5. Remove snow and ice adjacent to site and from access ways to the building and construction.
   6. Clean adjacent and nearby streets of dirt occasioned by construction operation; frequency and methods as required by governing authority.
   7. Vacuum clean interior building areas when ready to receive finish painting.

C. Contaminated Earth:
   1. Remove contaminated earth and dispose of off site. Replace with clean soils, as approved, in accordance with Section 02200 using materials appropriate to the location on the site and methods specified for fills and backfills.
   2. Contaminated earth includes only those contaminations caused by the Contractor, but is not limited to, waste concrete, mortar and plaster; debris and waste materials; areas used for cleaning tools, washing mixers and concrete trucks and areas containing oils, solvents, paints and similar liquids or their residues.

END OF SECTION 01561

SECTION 01600 - MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

1.03 DEFINITIONS

Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

A."Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1."Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

2."Foreign Products," as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

B."Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

C."Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.05 SUBMITTALS

A. Product List: A list of products required is included at the end of this Section. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

B. Product List: Prepare a list showing products specified in tabular form acceptable to the Architect. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.
   1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.
   2. Form: Prepare product list with information on each item tabulated under the following column headings:
      a. Related Specification Section number.
      b. Generic name used in Contract Documents.
      c. Proprietary name, model number, and similar designations.
      d. Manufacturer's name and address.
      e. Supplier's name and address.
      f. Installer's name and address.
      g. Projected delivery date or time span of delivery period.
   3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.
      a. At the Contractor's option, the initial submittal may be limited to product selections and

designations that must be established early in the Contract period.

4. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of the completed product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.

5.Architect's Action: The Architect will respond in writing to Contractor within 2 weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.06 QUALITY ASSURANCE

B. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
   1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
   1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contractors.
   2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, the Architect will determine which products shall be retained and which are incompatible and must be replaced.

C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:
   1. No available domestic product complies with the Contract Documents.
   2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.

D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
   1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
   2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
      a. Name of product and manufacturer.
      b. Model and serial number.
      c. Capacity.
      d. Speed.
         a.Ratings.

1.07 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
   1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
   2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
   1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
   2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:
   1. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.

2.Semiproprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.
   a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

   3. Nonproprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

4.Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

5.Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated.
   a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.

   6. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.

7.Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
   a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the

Contract Documents concerning "substitutions" for selection of a matching product in another product category.

8. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures ..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern, and texture from the product line selected.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
   1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01600

SECTION 01631 - SUBSTITUTIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

1.03 DEFINITIONS

A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B.Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1.Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

2. Revisions to the Contract Documents requested by the Owner or Architect.
3. Specified options of products and construction methods included in the Contract Documents.
4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.04 SUBMITTALS

A Substitution Request Submittal: The Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Architect.

1 Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.

2 Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.

3 Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

a.Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.

b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.

4 Product Data, including Drawings and descriptions of products and fabrication and installation procedures.

5 Samples, where applicable or requested.

6 A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.

c. Cost information, including a proposal of the net change, if any in the Contract Sum.

d. The Contractor's certification that the proposed substitution conforms to requirements

in the Contract Documents in every respect and is appropriate for the applications indicated.

e. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

5.Architect's Action: If necessary, the Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Architect will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.

a. Use the product specified if the Architect cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

A. Conditions: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect will return the requests without action except to record noncompliance with these requirements.

1.Extensive revisions to the Contract Documents are not required.

2. Proposed changes are in keeping with the general intent of the Contract Documents.

3. The request is timely, fully documented, and properly submitted.

4. The specified product or method of construction cannot be provided within the Contract Time. The Architect will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

5.The request is directly related to an "or-equal" clause or similar language in the Contract Documents.

6. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.

7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.

9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.

10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

11.Where a proposed substitution involves more than one prime contractor, each contractor shall cooperate with the other contractors involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of products.

B.The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

C. When substitution material are used, the contractor shall be responsible for space requirements, configuration, performance changes in bases, electrical requirements, structural members and openings in structure, and other apparatus and trades that may be affected by their use. Drawings detailing all modifications shall be provided and necessary structural and electrical calculations shall be made to insure compatibility with the building design.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01631

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Operation and maintenance manual submittal.
   4. Submittal of warranties.
   5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.03 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
   a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
   b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
2. Advise the Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
9. Complete final cleanup requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred, exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
   1. The Architect will perform one re-inspection when requested and assured that the Work is substantially complete. If subsequent re-inspections are required, the Architect will invoice the Owner for the time expended are the costs thereof shall be deducted from the contractors final payment.

2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.04 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1.Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, endorsed and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B.Reinspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance. If the Work is incomplete, the Architect will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, reinspection will be repeated. If subsequent re-inspections are required, the Architect will invoice the Owner for the time expended are the costs thereof shall be deducted from the contractors final payment.
3. The Contractor will be required to keep a “punch list” of all items to be completed on site. All subcontractors and the Contractor will be required to sign in and sign out each time they are on site, indicating the work that was review/completed. With the completion of a “punch list” item(s) the subcontractor, the Contractor and the Owners representative will be required to sign off on the item(s) completed. The “punch list” will not be complete until all items are complete with the required signatures.

1.05 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Architect's reference during normal working hours.

B.Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
3. Note related change-order numbers where applicable.
4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

C.Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
3. Note related record drawing information and Product Data.
4. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

D.Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
3. Upon completion of markup, submit complete set of record Product Data to the Architect for the Owner's records.

E.Record Sample Submitted: Immediately prior to Substantial Completion, the Contractor shall meet with the Architect and the Owner's personnel at the Project Site to determine which Samples are to be transmitted to the Owner for record purposes. Comply with the Owner's instructions regarding delivery to the Owner's Sample storage area.

F.Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Architect for the Owner's records.

G.Maintenance Manuals: Organize operation and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch (51-mm), 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommended "turn-around" cycles.
6. Inspection procedures.
7. Shop Drawings and Product Data.
8. Fixture lamping schedule.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures. Include a detailed review of the following items:

1.Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:
1. Startup.
2. Shutdown.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

3.02 FINAL CLEANING

A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls."

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1.Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.

a.Remove labels that are not permanent labels.

b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

e. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

C.Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests.

D. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.
1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01700

SECTION 01710 - FINAL CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A.Procedural requirements to perform final cleaning. Refer to Section 01561 for cleaning during construction.

B. Pollution Control: Conduct clean-up and disposal operations to comply with applicable anti-pollution laws and local ordinances.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS

A. Use only cleaning materials and methods recommended by manufacturer of surface to be cleaned and by the manufacturer of the cleaning materials.

PART 3 - EXECUTION

3.01 FINAL CLEANING

A. Perform final cleaning just prior to final completion inspection.
B. Use experiences workers, or professional cleaners for final cleaning.
C. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program.
D. Remove labels which are not required as permanent labels.
E. Remove grease, dirt, stains, films, fingerprints, and other noticeable distracting substances, from interior and exterior surfaces.
   1. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring material. Replace chipped or broken glass and other damaged transparent materials.
F. Except as otherwise indicated; avoid disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
G. Wipe surfaces of mechanical and electrical equipment clean, including elevator equipment, and similar equipment in addition to that specified in Division 15 and 16; remove excess lubrication and other substances.
H. Remove debris and surface dust form limited-access spaces including roofs, plenum, shafts, trenches, equipment vaults, manholes, attic and similar spaces.
I. Clean concrete floors in non-occupied spaces broom clean. Vacuum clean carpeted surfaces and similar soft surfaces. Power scrub and power buff resilient flooring surfaces and tile.
J. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
K. Repair, patch and touch-up marred surfaces to match adjacent finishes.
L. Broom clean paved surfaces; rake clean other surfaces of grounds.
M. Clean light fixtures and lamps so as to function with full efficiency, by electrical Installer.
N. Replace air supply unit filters if units were operated during construction, by mechanical Installer
O. Clean ducts, blowers, and coils if air supply units were operated without filters during construction, by mechanical Installer.
P. Maintain cleaning until the building, or portion thereof, is occupied or accepted by the Owner.

END SECTION 01710

SECTION 01720 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A.The recording, maintenance, preparation and submittal of Project Record Documents.

1.03 DOCUMENTS:

A. General:
   1. Store Documents in temporary field office apart from documents used for construction and maintain documents in clean, dry, legible condition. Do not use record documents for construction purposes. Label each document “PROJECT RECORD” in 1" or larger printed letters.
   2. Make documents available at all times for inspection by Architect, his Professional Consultants, and Owner.

B. Record Drawings:
   1. Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
      a. Submit as built shop drawings larger than 11" x 17" on reproducible media.
      b. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
      c. Mark new information that is important to the Owner, but was not shown on Contract Drawing or Shop Drawing.
      d. Note related Change Order numbers where applicable, in addition to showing actual changes.
      e. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
   2. Record drawing information with opaque lines and symbols conforming to Contract Drawings. Note where positions of elements have been changed. Follow methods directed by Architect.
   3. Keep Record Documents current. **Update at least weekly**.
   4. Do not permanently conceal any work, including lay-in ceiling panels, until required information has been recorded.
      a. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
      b. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
      c. Location of concealed valves, dampers, controls, balancing devices, junction boxes, clean-outs, other items requiring access or maintenance.

C. Record Specification:
   1. Maintain three complete copies of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that re concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

a. Upon completion of the Work, submit record Specifications to the Architect for the Owner's records.

D. Record Product Data:
1. Maintain one copy of Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendation. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
a. Upon completion of the mark-up, submit complete set of record Product Data to the Architect for the Owner's records.
2. Maintain product listing and record any changes made to it, either brand, model, Subcontractor or Installer so that final listing will accurately reflect the materials, equipment and systems incorporated in the Work.

E. Record Sample Submitted:
1. Immediately prior to the date or dates of Final Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

F. Miscellaneous Record Submittals:
1. Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Final Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and references. Submit to the Architect for the Owner's records.
2. Include manufacturer's certifications, field test records, copies of permits, licenses, certifications, inspection reports, releases, notices, receipts for fee payments, and similar documents.

1.04 SUBMITTAL

A. Complete this work and submit as specified in Section 01700.
1. Submit marked-up drawing prints and final product listing as part of Final Completion Documents.
2. Submit revised and corrected mark-ups if initial submittal is unsatisfactory as part of Final Completion Documents.

B. **Deliver record documents in "redline" paper format and electronic AutoCAD 2018 format with all revisions to Architect including all item listed above under "Documents".**

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01720

SECTION 01730 - OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

AAdministrative and procedural requirements for operating and maintenance manuals for mechanical, electrical and other equipment or systems.

B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

1.03 FORM OF SUBMITTALS

A Prepare data in form of an instructional manual for use by Owner's personnel.

1.04 Format:

A. Size: 8.5" x 11", 20 lb. minimum weight white paper for typed pages, either manufacturer's printed data, or neatly typewritten.
B. Drawings: Provide reinforces punched binder tab, bind in with text. Fold larger drawings to size of text pages.
C. Provide indexed tabs and fly-leaf for each separate product, or each piece of operating equipment. Include typed description of product, and major component parts of equipment.

1.05Cover:

A Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
1. Title of Project
2. Identify of separate structures as applicable.
3. Identify of general subject matter covered in the manual.

1.06Binders:

A. Commercial quality three-ring binders with durable and cleanable plastic covers, 1" minimum, 2" maximum ring size.
B. When multiple binders are used, correlate the data into related consistent groupings.

1.08CONTENT OF MANUALS

A. Neatly typewritten table of contents for each volume, arranged in systematic order.
B. Contractor, name of responsible principal, address and telephone number.
C. A list of each product required to be included, indexed to content of the volume.
D. List, with each product, name, address and telephone number of:
1. Subcontractor or Installer
2. Maintenance contractor, as appropriate.
3. Identify area of responsibility of each.
4. Local source of supply for parts and replacement.
E. Identify each product name and other identifying symbols as set forth in Contract Documents.

1.09 PRODUCT DATA

A. Include only those sheets which are pertinent to the specific product. Annotate each sheet to clearly identify specific product or part installed, data applicable to installation.

1.10 DRAWINGS

A. Supplement product data with drawing as necessary to clearly illustrate relations of component parts of equipment or systems and control and flow diagrams.
B. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.

1.11 WRITTEN TEXT

A. As required to supplement product data for the particular installation organized into consistent format under separate headings for different procedures. Provide logical sequence of instructions for each procedure.

1.12 OTHER DATA

A. Copy of each warranty, bond and service contract issued.
B. Provide information sheet for Owner's personnel, covering proper procedures in event of failure and instances which might affect validity of warranties or bonds.

1.13 MANUALS FOR EQUIPMENT AND SYSTEMS

A. Provide complete information for products specified in:
   1. Heating, ventilating and air-conditioning equipment and systems:
      Division 15 sections.
   2. Plumbing equipment and systems:
      Division 15 sections.
   3. Electrical System:
      Division 16 sections.
   4. Installed Appliances and/or office equipment, including washer, dryer, stove, hood, dishwasher and refrigerator
   5. Other equipment, special construction, conveying systems where specified in the individual sections.
B. Submit manuals with complete data as required, including the following as applicable.

1.14 DESCRIPTION OF UNIT AND COMPONENT PARTS

A. Function, normal operating characteristics, and limiting conditions; performance curves, engineering data and tests; complete nomenclature and commercial number of replaceable parts.

1.15 OPERATING PROCEDURES

A. Start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shut-down and emergency instructions; summer and winter operating instructions; special operating instructions.

1.16 MAINTENANCE PROCEDURES

A. Include routine operations, guide to "trouble-shooting", disassembly, repair and reassembly, alignment, adjusting and checking.
B. Include lubrication schedule, lubricants required and filter cleaning or replacement schedule.

1.17 INSTRUCTIONS

A. Submit manufacturer's printed operating and maintenance instructions with description of sequence of operation, original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance covering predicted life of parts subject to wear and items recommended to be stocked as spare parts.
B. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel or when specified in respective sections.

1.18 DIAGRAMS, CHARTS

A. Submit as-installed control diagrams by controls manufacturer, charts of valve tag numbers, with location and function of each valve, content for each electric and electronic system, as appropriate, circuit directories of panelboards, electrical service and distribution, controls, and communications systems with as-installed color coded wiring diagrams.

1.19 SUBMITTAL SCHEDULE

A. Submit one copy of completed data in final form fifteen days prior to final completion inspection. Copy will be returned after final completion inspection with comments.
B. Submit 3 copies in final corrected form 10 days prior to final inspection or acceptance.

1.20 START UP AND INSTRUCTIONS

A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems.
B. Test and start up all systems as specified in the appropriate sections. Where so specified, arrange for each Installer to provide instructions to the Owner's personnel in the operations of such systems. Notify both the Architect and the Owner, in writing, at least seven days in advance of such start-ups, tests, and demonstrations.
C. Include instructions by manufacturers representatives when so specified or where installers are not expert in the required procedures. Review maintenance manuals, record documentation,, tools, spare parts and materials, lubricants, fuels, identification system, control sequences, hazards, cleaning and similar procedures and facilities.
D. For operational equipment, demonstrate start-up, shut-down, seasonal changeovers, emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustments, and similar operations. Review maintenance and operations in relation with applicable warranties, agreements to maintain, bonds, and similar continuing commitments.

1.21 FRAMED OPERATING AND MAINTENANCE INSTRUCTIONS

A. All mechanically and electronically operated equipment and controls shall be provided with legible and complete wiring diagrams, schematics, operating instructions, and pertinent preventative maintenance instructions in a sturdy frame with clear glass or plastic cover. Utilize non-fading, permanent media.
B. Frames shall be located in the same room or service enclosure as the equipment, or in the nearest mechanical or electrical room.
C. Submit proposed instructions to Architect for review and acceptance prior to installation.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01730

SECTION 01740 - WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. General administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1.03 DISCLAIMER AND LIMITATIONS

A. Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturer's, and Subcontractors required to countersign special warranties with the Contractor.

1.04 DEFINITIONS

A. Standard Product Warranties:
   1. Preprinted written warranties published by individual manufacturers for particular products and specifically endorsed by the manufacturer to the Owner.
B. Special Warranties:
   1. Written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.05 WARRANTY REQUIREMENTS

A. Related Damages and Losses:
   1. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
B. Reinstatement of Warranty:
   1. When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
C. Replacement Cost:
   1. Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefitted from use of the Work through a portion of its anticipated useful services life.
D. Owner's Recourse:
   1. Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
      a. Rejection of Warranties: The Owner reserves the right to reject a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.07 SUBMITTALS

B. Submit written warranties to the Architect prior to Final Completion. If the Owner's letter of acceptance designates a commencement date for warranties other than the date of Final Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.
   1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.
   2. When special warranty is required to be executed by the Contractor, or the Contractor and a Subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.
      a. Refer to individual Sections of Divisions 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.

1.08 FORM OF SUBMITTAL

A. At Final Completion, compile original and 2 copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, Subcontractor, supplier or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
B. Bind warranties and bonds in heavy duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8.5" by 11" paper.
   1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the Installer.
   2. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the Project title and name, and the name of the Contractor.
   3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

1.09 LIST OF SPECIFIC WARRANTIES

A. Flush and Panel Wood Doors
B. Aluminum Storefronts
C. Glazing
D. Mechanical and Plumbing Equipment
E. Electrical Equipment

PART 2- PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01740

SECTION 06200 — FINISH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General and Supplementary Conditions of the Contract, General Requirements and other applicable technical specifications apply to work of this Section

1.02 SECTION INCLUDES

A. Finish carpentry items.
B. Metal doors and hardware installation
C. Wood door frames, glazed frames.
D. Hardware and attachment accessories.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade indicated and, where the following products are part of interior woodwork, with requirements of the referenced product standards that apply to product characteristics indicated:
B. General: Provide materials that comply with requirements of the WIC quality standard for each type of woodwork and quality grade indicated, unless otherwise indicated.
    1. Hardboard: AHA A135.4.
    2. Medium-Density Fiberboard: ANSI A208.2.
    3. Particleboard: ANSI A208.1, Grade M-2.
    4. Softwood Plywood: PS 1.
    5. Hardwood Plywood and Face Veneers: HPVA HP-1.
        a. Formaldehyde Emission Level for Medium-Density Fiberboard: Comply with requirements of NPA 9.
        b. Fiberboard: Medium-density fiberboard made without formaldehyde and complying with ANSI A208.2.

2.02 INSTALLATION MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
B. Screws: Select material, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements.
C. For metal framing supports, provide screws as recommended by metal-framing manufacturer.
D. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
E. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors.

2.03 FABRICATION, GENERAL

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

B.. Complete fabrication, including assembly, finishing, and hardware application, before shipment to Project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Trial fit assemblies at the fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on approved shop drawings before disassembling for shipment.

C. Shop-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating.

2.05 INTERIOR DOOR FRAMES AND STOPS

A. Quality Standard: Comply with AWI Section 300.
   1. Grade: Custom
B. Material: Mill option wood for factory finish.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.
B. See Section 06100-Rough Carpentry for installation of recessed wood blocking.

3.02 INSTALLATION

A. ALL SCREW SHALL BE COUNTERSUNK AND PLUG WITH STAIN TO MATCH.
B. Set and secure materials and components in place, plumb and level.
C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
D. Install all door hardware for doors.
E. Install hardware in accordance with manufacturer's instructions.

3.03 ERECTION TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.
B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06200

SECTION 06200 — FINISH CARPENTRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General and Supplementary Conditions of the Contract, General Requirements and other applicable technical specifications apply to work of this Section

1.02 SECTION INCLUDES

A. Finish carpentry items.
B. Metal doors and hardware installation
C. Wood door frames, glazed frames.
D. Hardware and attachment accessories.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade indicated and, where the following products are part of interior woodwork, with requirements of the referenced product standards that apply to product characteristics indicated:
B. General: Provide materials that comply with requirements of the WIC quality standard for each type of woodwork and quality grade indicated, unless otherwise indicated.
    1. Hardboard: AHA A135.4.
    2. Medium-Density Fiberboard: ANSI A208.2.
    3. Particleboard: ANSI A208.1, Grade M-2.
    4. Softwood Plywood: PS 1.
    5. Hardwood Plywood and Face Veneers: HPVA HP-1.
        a. Formaldehyde Emission Level for Medium-Density Fiberboard: Comply with requirements of NPA 9.
        b. Fiberboard: Medium-density fiberboard made without formaldehyde and complying with ANSI A208.2.

2.02 INSTALLATION MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
B. Screws: Select material, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements.
C. For metal framing supports, provide screws as recommended by metal-framing manufacturer.
D. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
E. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors.

2.03 FABRICATION, GENERAL

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

B.. Complete fabrication, including assembly, finishing, and hardware application, before shipment to Project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
   1. Trial fit assemblies at the fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on approved shop drawings before disassembling for shipment.

C. Shop-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating.

2.05 INTERIOR DOOR FRAMES AND STOPS

A. Quality Standard: Comply with AWI Section 300.
   1. Grade: Custom
B. Material: Mill option wood for factory finish.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.
B. See Section 06100-Rough Carpentry for installation of recessed wood blocking.

3.02 INSTALLATION

A. ALL SCREW SHALL BE COUNTERSUNK AND PLUG WITH STAIN TO MATCH.
B. Set and secure materials and components in place, plumb and level.
C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
D. Install all door hardware for doors.
E. Install hardware in accordance with manufacturer's instructions.

3.03 ERECTION TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.
B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06200

SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this section.

1.02 SUMMARY

A. This Section includes the following:

1. Plastic laminate cabinets with hardwood veneer faced doors.
2. Plastic laminate cabinets
3. Shelving
4. Counter tops

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

1.03 SUBMITTALS

A. Product Data: For laminate surfacing material, cabinet hardware and accessories.

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

C. Samples:

1. Lumber and panel products for transparent finish, for each species and cut, finished on one side and one edge.

1.02 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of woodwork.

B. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards."

1.03 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.01 WOODWORK FABRICATORS

A. Fabricators: Subject to compliance with requirements, provide interior architectural woodwork by fabricators approved by the Owner and Architect.

2.02 MATERIALS

A. Wood Species: Cabinet doors and drawer fronts that are not stainless steel wrapped shall be constructed with hardwood veneer fronts and edges. Back sides of doors and drawers shall have veneer to match front of a color as selected by Architect to match the hardwood stain color of the fronts.

1. Species: CHVG Alder flat cut or approved equal
2. Doors to be running match for veneer face assembly

B. Wood Products:

1. Hardboard: AHA A135.4.
2. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
3. Particleboard: ANSI A208.1, Grade M-2.
4. Softwood Plywood: DOC PS 1.
5. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.
6. All drawers to be dove tail construction.

C. Quartz counter top surfacing. 3 cm thickness. Colors as selected by Architect.

1. Manufacturers
   a. Caesarstone USA
   b. E. I. du Pont de Nemours and Company.

2. Brackets.
   a. All countertop bracket supports to be black concealed (floating) brackets.

D. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
1. Manufacturer: Subject to compliance with requirements, provide high-pressure decorative laminates by one of the following:
   a. Formica Corporation.
   b. Laminart.
   c. Nevamar Corp.
   d. Pioneer Plastics Corp.
   e. Westinghouse Electric Corp.; Specialty Products Div.
   f. Ralph Wilson Plastics Co.

2. Brackets
   a. All countertop bracket supports to be black concealed (floating) brackets.

E. Adhesive for Bonding Plastic Laminate: Contact cement.

F. Thermoset Decorative Overlay: Decorative surface of thermally fused polyester or melamine-impregnated web, bonded to specified substrate and complying with ALA 1992.
1. Substrate: Medium-density particleboard.
2. Substrate: Medium-density fiberboard

2.03 CABINETS

A. Quality Standard: Comply with AWI Section 400 requirements for laminate-clad cabinets.
   1. Grade: Custom

B. AWI Type of Cabinet Construction: Flush overlay doors. All face frames and exposed box sides shall be of CHVG Alder, plain slip matched.

C. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
   1. Horizontal Surfaces Other than Tops: GP-50, 0.050-inch (1.270-mm) nominal thickness.
   2. Vertical Surfaces: GP-50, 0.050-inch (1.270-mm) nominal thickness.
   3. Edges: GP-50, 0.050-inch (1.270-mm) nominal thickness.

D. Materials for Semiexposed Surfaces: Provide surface materials indicated below:
   1. Surfaces Other than Drawer Bodies: Thermoset decorative overlay.
   2. Drawer Bottoms: Thermoset decorative overlay.
   3. Bottom of upper cabinets to be finished the field color of the door body.

E. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
   1. Provide Architect's selections from laminate manufacturer's full range of colors and finishes in the following categories:
      a. Solid colors.

F. Provide dust panels of 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers except where located directly under tops.

G. Doors: All cabinet doors and draw faces shall have hardwood veneer faces and edges, inside and out.
   1. Species: CHVG Alder plain slip matched.
   2. Finish: Factory finish per Finish Plan
   3. Provide 4" wire pull brushed nickle
   4. Drawers to be heavy duty soft closing hardware.

H. Roll Out Shelving: All rollout shelving is to have a minimum of a 1 1/2" surround on all sides.

I. Layout: All cabinets are to be designed by the contractor to prevent cabinet doors and drawers from “hitting” other drawers, doors, walls, or equipment when open. Contractor to provide filler panels at inside corners and at wall terminations as required.

2.04 COUNTERTOPS

A. Quality Standard: Comply with AWI Section 400 requirements for countertops.
   1. Grade: Custom

B. Material: Quartz

C. Brackets.
   a. All countertop bracket supports to be black concealed (floating) brackets.

2.05 PARTICLEBOARD SHELVING

A.Quality Standard: Comply with AWI Section 400 requirements for clad shelving
1.Grade: Custom
2.All surfaces: Thermoset decorative overlay
A.Edge Treatment: Same as horizontal surfaces.
B.Standards: KV-80 ANO single slot, KV-85 ANO double slot
C.Brackets: KV-183R ANO Right Flange Bracket, KV-183L ANO Left Flange Bracket, KV-180 ANO Flange Bracket.
D.Provide double-slot standards and flange brackets at rows of shelves longer than 6'. Where double-slot standards and flange brackets are provided, provide individual shelves between standards and fasten brackets to shelves with screws.

2.06 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, fire-retardant-treated, kiln-dried to less than 15 percent moisture content.

B. Hardware:
1. Cabinet Hinges: basis of design Blum CLIP top 120 degree hinges or Blum Clip top BLUMOTION 110 DEGREE (SOFT CLOSE)
a. Note: 2 hinges equals 1 soft close hinge required and 3 hinges for 36" or larger doors equals 2 soft close hinges required
2. Door & Drawer Pulls: 4" brushed chrome pulls
3. Drawer Glides: basis of design WURTH Pro 100 ball bearing slides and KV 8400 for larger size drawers OR Blum TANDEM PLUS BLUMOTION 536H FULL EXTENSION (SOFTCLOSE)
a. Exceed BHMA Grade 1 requirements (75# dynamic load capacity and 100# static load capacity).
b. **Drawers to be heavy duty soft closing hardware**

2.07 WINDOW SILLS

A. Hardwood sills shall be quarter sawn walnut.

2.08 FABRICATION

A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.

4. Interior Woodwork Grade: Custom.
5. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm). Shim as required with concealed shims.

B. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

C. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 (400 mm) o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

END OF SECTION 06402

SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. General building insulation work for:
   1. Concealed batt or blanket building insulation.

1.03 SUBMITTALS

A. Product Data:
   1. Submit manufacturer's specifications for each type of insulation and vapor barrier material required.

1.04 QUALITY ASSURANCE

A. Fire Performance Characteristics:
   1. Provide insulation materials whose fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings.
      a. Surface Burning Characteristic: ASTM E84.
      b. Fire Resistance Ratings: ASTM E119.
      c. Combustion Characteristics: ASTM E136.

1.05 DELIVERY, STORAGE AND HANDLING

A. Protection from Deterioration:
   1. Do not allow insulation materials to become wet or soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

PART 2 - PRODUCTS

2.01 INSULATION MATERIALS

A. Mineral/Glass Fiber Batt Insulation:
   1. Glass or slag (non-asbestos) fibers formed with thermosetting resins into resilient flexible blankets or semi-rigid batts; ASTM C665, Types as indicated, density not less than 0.5 lbs. per cu. ft. for glass and 2.5 lbs. per cu. ft. for mineral wool; manufacturer's standard sizes, thicknesses to provide R=19 for walls.
      a. Type III: Reflective aluminum foil vapor barrier faced units, with nailing flanges on long edges; vapor transmission not more than 0.1 perms.
      b. Surface Burning Characteristics: Maximum flame spread of 25 and smoke developed of 50.
   2. Where units are included in fire-rated wall construction, provide insulation units which have been tested and rated as required for the indicated assembly.

B. Sound Batt Insulation:
   1. Basis of design for sound batt insulation is Thermafiber SAFB Mineral Wool Insulation

C. Compressible Insulation:
1. The type recommended by the insulation manufacturer and capability to bond insulation to substrate to allow for required assembly movement and fire rating.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:
1. Comply with manufacturer's instructions applicable to products and application indicated. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
2. Extend insulation full thickness as shown over entire surface to be insulated. Cut and fit tightly around obstructions and fill all voids. Do not install batt insulation on top of or within 3" of recessed light fixtures, unless light fixtures are approved for such installation.
3. Apply a single layer of insulation of the required thickness, unless otherwise shown or required to make up the total thickness.

B. Unit-Type Building Insulation:
1. Apply insulation units of the type shown on the substrate by the method indicated, complying with the manufacturer's recommendations.
   a. Friction fit batt insulation at metal stud framing to completely fill spaces. Minimize cross joints and seal with adhesive tape.
2. Set vapor barrier faced units with vapor barrier to warm side of construction. Do not obstruct ventilation spaces.
3. Tape ruptures in vapor barriers, using adhesive tape of type recommended by insulation manufacturer.
4. In metal frame construction spaces too small for batt insulation or inaccessible for its installation, fill spaces with pressurized container foamed in place insulation of acceptable type and having equivalent thermal performance to batt insulation required.

C. Perimeter Insulation:
NOT USED

END OF SECTION 07210

SECTION 07280 - INSULATING SPRAY FOAM SYSTEM FOR WALLS

1.01 SECTION INCLUDES

A. Insulating spray foam system for voids and openings in walls.

1.02 RELATED SECTIONS

A. Section - Rough Carpentry.

B. Section - Joint Sealants.

C. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 apply to this Section.

1.03 SUBMITTALS

A. Submit Product data as specified in Section 01 for Shop Drawings, Product Data and Samples for each product.

B. Foam Sealant Air System to be installed at ALL exterior wall opening assembly systems.

1.04 QUALITY ASSURANCE

A. Regulatory Approvals: Provide products with the following approvals.
1. BOCAI-ES, Report 96-32.01, Spray Polyurethane Foams.
2. ICBO Evaluation Service, Inc, Report ER-3974, ES Report Filling Category: Insulation, Spray-Applied Polyurethane Foams.
3. National Research Council Canada, Report CCMCa 13074-R, Institute for Research in Construction, Product Evaluation Report.
4. SBCCI-ES, Report 9571B, Evaluation of Product for Compliance with the Standard Building Code and Submission to Building Officials or Other Authorities Having Jurisdiction for Product Usage.
5. Underwriters Laboratories, Report R7813, Product Evaluation.
6. Underwriters Laboratories, Report R13655, Product Evaluation.

B Installer: Qualified installer with minimum 1 year experience in application of spray applied foams.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver and store products undamaged in original containers with manufacturer's labels and seals intact.

B Do not store at temperatures above 120 degrees F. Avoid prolonged storage in direct sunlight or near heat sources.

C. Protect Foam Sealant Air System materials from physical damage and from deterioration due to moisture, soiling and other sources. Store inside and in a dry location. Comply with manufacturer’s written instructions for handling, storing and protecting during installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers of insulating spray foam system for walls having products considered acceptable for use:
1 BASF Walltite Plus or Walltitel LWP
2 Or approved equal.

B Substitution Procedures: refer to Section 01 Instruction to Bidders

2.02 MATERIALS

A. Polyurethane Foam: Two-component chemically-cured spray-applied polyurethane foam with the following characteristics:
1. Manufacturer: The Dow Chemical Company.
2. Product: FROTH-PAK™ foam density 1.75 pounds per cubic foot
3. Minimum R value of 6 per inch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect existing conditions to ensure they are suitable for product application. Do not proceed until unacceptable conditions are corrected.

3.02 INSTALLATION

A. Install materials in strict compliance with manufacturer’s written installation instructions, when ambient temperature is between 60 and 80 degrees F, with lower application temperature (above freezing) acceptable if kit contents are at least 75 degrees F.

B Protect adjacent Work from damage. Clean adjacent surfaces of excess product and overspray.

C. Foam Sealant Air System: Apply Foam Sealant Air System according to manufacturer's written instructions. Do not apply Foam Sealant Air System until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive Foam Sealant Air System are masked. After Foam Sealant Air System is applied, make flush with finished surface by using method recommended by Foam Sealant Air System manufacturer.

D Miscellaneous Voids: Install Foam Sealant Air System in miscellaneous voids and cavity spaces where indicated on Drawings and where required to prevent air infiltration.

3.03 PROTECTION

A. Protect installed Foam Sealant Air System from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where Foam Sealant Air System is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

B For exterior uses, provide a coating or painting for protection from ultraviolet radiation.

END OF SECTION

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A.Flashing and sheet metal work as shown on the drawings with **NO EXPOSED FASTENERS** for:
1. Metal flashing and counterflashing.
2. Copings and wall caps.
3.. Metal gutters and downspouts (rain drainage).
4.. Metal covering and flashing of equipment supports.
5.. Sealants for sheet metal: Refer to Section 07900 for materials and installation methods.

1.03 SUBMITTALS

A. Product Data:
   1. Submit product data, installation instructions, and general recommendations by the manufacturer of flashing and sheet metal materials.
B. Samples:
   1. Submit full size samples of typical profiles and joints.

1.04 QUALITY ASSURANCE

A. Except as otherwise indicated, conform to requirements and recommendations of SMACNA "Architectural Sheet Metal Manual" Fifth Edition, 1993, as applicable and including forming, anchoring, cleating and forming expansion joints, seams and details for accommodation of thermal movement.
B. Completed work must be free from water leakage under all weather conditions.

1.05 PROJECT/SITE CONDITIONS

A. Do not proceed with the installation of flashing and sheet metal work until curb and substrate construction, cant strips, blocking, reglets and other construction to receive the work is completed.
B. Coordinate with roofing work for scheduling installation of counterflashing, rain drainage and similar items related to roofing.

1.06 WARRANTY

A. Submit manufacturer's printed 20 year warranty of the finish against fading, chalking, and film failure.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Metals:
   1. Mill Phosphatized Zinc-Coated Steel Sheet:: Commercial quality carbon steel sheets with minimum of 0.20% copper content complying with ASTM A526 or A527 for lock-forming; hot-dip galvanized to comply with ASTM A525, G90, mill phosphatized, 24 gage except as otherwise indicated.
   2. Prefinished Work: "Hickman Kynar 500" by W.P. Hickman Company or approved equal.

a. Zinc-Coated Steel Sheet: Commercial quality extra smooth carbon steel sheets complying with ASTM A446, Grade A, with hot-dipped galvanized coating complying with ASTM A525, G90, 0.0259" thick (24 gage) unless otherwise indicated.

B. Miscellaneous Materials:
1. For metal work, provide the type solder and fasteners recommended by the producer of the metal sheets, for fabrication and installation.
a. Use ASTM B32, 50% tin and 50% lead, with rosin flux, unless otherwise recommended.
2. Roofing Cement: ASTM D2822, asphaltic base.
3. Reglets: Provide closed slot reglets to receive snap-lock counterflashing equal to Fry Reglet Co., type S, 24 ga. galvanized sheet steel.
4. Nails and Fasteners: Use type and form of metal fastener compatible with base metal and support substrate.
5. Soffit Vents: Provide soffit vents as shown on drawings.

2.02 FABRICATION

A. General:
1. Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
2. Shop fabricate metal flashing, trim, sheet metal drainage work and similar items to comply with profiles and sizes shown, and to comply with standard industry details as shown by SMACNA in the "Architectural Sheet Metal Manual".
3. Provide soldered common-lock seams not less than 0.75" wide, and fold back metal to form a hem on the concealed side of exposed edges. Orient seams properly for direction of water flow. Comply with metal producer's recommendations for tinning, soldering, and cleaning flux from metal.
4. Fabricate work concealed from normal view from mill phosphatized, zinc-coated steel sheet and work exposed to normal view from prefinished steel sheet using 8' to 10' lengths for continuous item except where otherwise indicated.

B. Edge Strips and Cleats:
1. Fabricate from specified metals to profiles indicated or required using 2.75" widths for continuous edge strips and 2" width, 3" long for cleats.

C. **Counterflashings:**
1. Form upper edge of counterflashings with a snap-lock flange to engage reglet receiver and to provide a spring action at bottom edge against base flashings.

D. Metal Coverings and Flashing of Equipment Supports on Roofs:
1. Cover raised bases and equipment supports on roofs with 20 gage mill-phosphatized zinc-coated sheet steel. Fabricate metal to shapes required using soldered flat seams. Extend counterflashing over base flashing 4" and fold bottom edge back 0.5" on underside.

E. Gravel Stops and Fascias:
1. Fabricate gravel stops and fascias to profiles shown. Use heavier than minimum specified gage where profiles or other conditions would otherwise result in unacceptable distortion or "oil-canning" over 150 degrees F. temperature range. Form corners by mitering and solder joint. Make joints with 3/16" expansion space between sheets and 6" wide cover plates formed to exact profile of gravel stops and fascias.

F. Downspouts:
1. Fabricate to profiles shown either in 8' to 10' lengths or by roll forming from 26 gage coil stock, with open face pattern.
a. Provide bottom discharge elbows.
b. Provide 8" shields above and below all downspout direction changes.
c. Provide slope at all downspouts elbows for proper water discharge.
1. Shop drawings to show downspout profiles for approval.
d. All downspouts to be ½" maximum off of finished exterior wall surfaces.

G. Formed Metal Copings:
1. Fabricate copings to profiles shown. Make cross joints between coping sheets with 3/16"

expansion joint between sheets and 2" wide J9 drive cover plate formed to profile of coping. Form cross joints in coping in accordance with details shown in Table 3-1, page 3.3, of SMACNA Manual.

a. Fabricate using prefinished metal.
b. Miter, seam and seal corners of coping with solder.

H. Cap Flashing Joint Details
1. All cap flashing joints to be installed per SMACNA Figure 3-2-4.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:
1. Comply with manufacturer's instructions and recommendations for handling and installation of flashing and sheet metal work.
2. Conceal fasteners and expansion provisions wherever possible.

B. Cleats and Edge Strips:
1. Secure edges of sheet metal members over 12" wide and at other locations indicated with cleats. Space at 12" o.c. unless otherwise indicated.
2. Provide continuous edge strips for attaching exposed terminating edge of copings, gravel stops or fascia-gravel stops for roofing. Provide butt joints of 0.125" width or greater as necessary to accommodate thermal movement.

C. Flashings and Counterflashings:
1.Place surface mounted reglet not less than 9" above cant strip. Place sealant in preformed groove on back of reglet and on lap before installation. Fill with sealant and tool tight to wall. After roofing is applied, install snap-lock counterflashing.

a. Refer to Section 07900 for sealants.

2. Lap counterflashing end joints 3". Make counterflashings continuous at angles and corners and lap over base flashings a minimum of 4" unless shown otherwise.

D. Downspouts:
1. Provide downspouts on outside walls for existing scuppers. Telescope end joints 1.5" and lock longitudinal joints. Secure to wall with concealed clamp supports, spaced not more than 8' apart.

E. Formed Metal Copings:
1. Extend front edge of coping cover down over and lock into continuous edge strip.
2. Terminate rear edge of coping cover with folded edge or join to adjacent flashing. Apply sealant to space between coping and cover plates.
3. Miter, seam and seal corners of coping with solder.

F. Metal Coverings and Flashings of Equipment Supports in Roof:
1. Provide metal coverings and flashings to cover raised bases and equipment supports on roof.

G. Prefinished Work:
1. Take special care in the fabrication, handling and installation of prefinished work to avoid damage to finish. Remove protective film from each unit after installation. Touch up minor defects to match factory finish. Replace units excessively damaged as determined by Architect.

END OF SECTION 07620

SECTION 07920 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.
4. Acoustical joint sealants.

B. Related Sections:

1. Division 04 "Unit Masonry" for masonry control and expansion joint fillers and gaskets.
2. Division 07 "Fire-Resistive Joint Systems" for sealing joints in fire- resistance-rated construction.
3. Division 07 "Acoustical Joint Sealants" for sealing joints in acoustically- rated construction.
4. Division 08 "Glazing" for glazing sealants.
5. Division 09 "Gypsum Board" for sealing perimeter joints.
6. Division 09 "Acoustical Panel Ceilings" for sealing edge moldings at perimeters with acoustical sealant.
7. Division 02 "Concrete Paving Joint Sealants" for sealing joints in pavements, walkways, and curbing.

1.3 DEFINITIONS

A. Isolation Joints: Junctions of horizontal and vertical surfaces where each surface is not structurally connected and can move independently.

1. Horizontal surfaces include the following:
    a. Concrete slab-on-grade
    b. Masonry and stone pavements on grade
2. Vertical surfaces include the following:
    a. Column pedestals
    b. Foundations walls
    c. Grade beams
    d. Exterior walls, including those with veneers
    e. Storefronts
    f. Curtainwalls

1.4 REFERENCE STANDARDS

A. ASTM – American Society for Testing and Materials:

1. ASTM C834 Standard Specification for Latex Sealants
2. ASTM C920 Standard Specification for Elastomeric Joint Sealants
3. ASTM C1021 Standard Practice or Laboratories Engaged in Testing of Building Sealants
4. ASTM C1087 Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems
5. ASTM C1193 Standard Guide for Use of Joint Sealants
6. ASTM C1247 Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids
7. ASTM C1248 Standard Test Method for Staining of Porous Substrate by Joint Sealants
8. ASTM C1311 Standard Specification for Solvent Release Sealants
9. ASTM C1330 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants
10. ASTM C1521 Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealants

1.5 PRECONSTRUCTION TESTING

A. Manufacturer Compatibility and Adhesion Testing: Submit to joint sealant manufacturer samples of materials that will contact or affect joint sealants.

1. Schedule sufficient time for testing and analyzing results to prevent delaying of work.
2. Use manufacturer's standard test method to determine what primers and joint preparation is required.
3. Sealants not requiring a primer to achieve satisfactory adhesion are preferred.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follow:

1. Locate test joints where directed by Architect.
2. Conduct field tests for each kind of sealant and joint substrate indicated.
3. Notify Architect seven days in advance of when test joints will be tested.
4. Arrange for test to take place with joint sealant manufacturer's technical representative present.

    a. Test Method: Test joint sealants according to Field-Applied Sealant Joint Hand Pull Tab in ASTM C1193 or Tail Procedure in ASTM C1521.

1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed adhesively or cohesively. For sealants failing adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants passing adhesion testing will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.6 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

1. Include temperature ranges for storage, application of materials, special cold weather application requirements and limitations.
2. Include cleaner and substrate primer recommended by sealant manufacturer for specific substrate surface and conditions.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide samples with joint sealants in ½ inch wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint Sealant Schedule: Include the following information:

1. Joint sealant application, joint location, and designation
2. Joint sealant manufacturer and product name
3. Joint sealant formulation
4. Joint sealant color

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer

B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

C. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods result in optimal adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

D. Warranties: Sample of special warranties.

1.8 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 each kind of joint sealant from single source and manufacturer. Sealants, primers and accessories are to be within shelf-life and acceptable for use per the manufacturer's written documents.

C. Preinstallation Conference: Conduct conference at Project site and include representative from sealant manufacturer.

1.9 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When joint substrates are wet or inclement weather is expected to interfere with sealant cure.
3. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
5. When materials are found to be different than those indicated in Contract Documents.

1.10 WARRANTY

A. Sealant Installer's Warranty: Repair or replace sealant that does not comply with Project requirements or does not remain watertight.

1. Warranty Period: 2 years from date of Substantial Completion

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Exterior Silicone Joint Sealants: 20 years from Substantial Completion date
2. Exterior Urethane Joint Sealants: 5 years from Substantial Completion date

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.

2. Disintegration of joint substrates from natural causes exceeding design specifications
3. Mechanical damage caused by individuals, tools or other outside agents
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants

PART 2 – PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application as demonstrated by joint sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24)

1. Architectural Sealants: 250 g/L
2. Sealant Primers for Nonporous Substrates: 250 g/L
3. Sealant Primers for Porous Substrates: 775 g/L

C. Liquid Applied Joint Sealants: Comply with ASTM C920 and other requirements indicated for each liquid applied joint sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.

D. Stain Test Characteristics: Where sealants are specified to be applied to porous substrates, provide products that have been tested according to ASTM C1248 and have not stained porous joint substrates indicated for the Project.

E. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

F. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. **JS-1** Single Component, Nonsag, Neutral Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use NT, T, A, G, M, O

1. Subject to compliance with requirements, provide one of the following:

a. Dow Chemical, DOWSIL 790
b. A substitution request

B. **JS-2** Single component, Nonsag, Neutral Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, Use NT, A, G, M

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL 791, 795, 756SMS
   b. A substitution request

C. **JS-3** Single Component, Nonsag, Neutral Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT, A, G

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL 799
   b. A substitution request

D. **JS-4** Single Component, Nonsag, Acid Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT, A, G

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL 999-A
   b. A substitution request

E. **JS-5** Single Component, Nonsag, Traffic-Grade, Neutral Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use T, A, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL 790, NS Parking Structure Sealant
   b. A substitution request

F. **JS-6** Single Component, Pourable, Traffic-Grade Neutral Curing Silicone Joint Sealant: ASTM C920, Type S, Grade P, Class 100/50, Use T, A, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL SL Parking Structure Sealant
   b. A substitution request

G. **JS-7** Multi-Component, Pourable, Traffic-Grade, Neutral Curing Silicone Joint Sealant: ASTM C920, Type M, Grade P, Class 100/50, Use T

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL FC Parking Structure Sealant
   b. A substitution request

H. **JS-8** Mildew Resistant, Single Component, Acid Curing Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL 786 Mildew Resistant
   b. A substitution request

I. **JS-9** Single Component, Nonsag, Silicone Resin Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25

1. Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical, DOWSIL 758 Weather Barrier Sealant
   b. A substitution request

2.3 URETHANE JOINT SEALANTS

A. **JS-10** Single Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use NT, T, A, G, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation, Sikaflex 15LM High Performance Sealant
   b. A substitution request

B. **JS-11** Single Component, Nonsag, Hybrid Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, Use NT, A, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. BASF Building Systems: MasterSeal NP100
   b. A substitution request

C. **JS-12** Single Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 35, Use NT, T, I, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 1A
   b. A substitution request

D. **JS-13** Single Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade P, Class 25, Use NT, T, A, G, I, M

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 1CSL
   b. A substitution request

E. **JS-14** Multi-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade P, Class 25, Use NT, T, M, A

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 2C NS EZ Mix

b. A substitution request

F. **JS-15** Immersible, Single Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT,T, I, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 1A
   b. A substitution request

G. **JS-16** Single Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade P, Class 25, Use NT, T, A, G, I, M

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 1CSL
   b. A substitution request

H. **JS-17** Immersible, Multi-Component, Nonsag, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use T, A, M, I, O

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 2C NS EZ Mix
   b. A substitution request

I. **JS-18** Immersible, Multi-Component, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade P, Class 25, Use NT, T, A, I, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 2C SL
   b. A substitution request

J. **JS-19** Multi-Component, Nonsag, Epoxy, Pick-Proof Security Sealant:

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikadur 51 NS
   b. A substitution request

K. **JS-20** Multi-Component, Nonsag, Urethane, Tamper-Resistant Security Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT, T, A, G, M, O

1. Subject to compliance with requirements, provide one of the following:
   a. Sika Corporation: Sikaflex 2C NS TG
   b. A substitution request

2.4 LATEX JOINT SEALANT

A. **JS-30** Latex Joint Sealant: Acrylic or Siliconized Acrylic Latex meeting ASTM C834, Type OP, Grade NF.

1. Subject to compliance with requirements, provide one of the following:
   a. Pecora Corporation: AC-20+
   b. A product substitution

2.5 SOLVENT-RELEASE CURING JOINT SEALANT

A. **JS-40** Butyl Rubber-Based Joint Sealant meeting ASTM C1311

1. Subject to compliance with requirements, provide one of the following:
   a. Pecora Corporation: BC-158
   b. A product substitution

2.6 JOINT SEALANT BACKING

A. General: Provide sealant backings of material that are nonstaining, compatible with joint substrates, sealants, primers, other joint fillers and are approved for applications indicated by sealant manufacturer based on field and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, Type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Type indicate below except where approved otherwise in writing by joint-sealant manufacturer for joint application indicated.

Location	Wall / Floor	Acceptable Backer Rods
Exterior	Wall	Closed Cell or Soft Rod with surface skin
		Only use Open Cell in Double Seal condition
	Floor	Closed cell or soft rod with surface skin
Interior	Wall	*Wet Enviroments* : Closed Cell or Soft Rod with surface skin
		Dry Environments : Open Cell; Closed Cell or Soft Rod acceptable
	Floor	Open cell; closed or soft rod with surface skin
		Closed Cell or Soft Rod with surface skin

C. Bond Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.8 SEALANT SELECTION TABLES:

Table 1: Exterior vertical and horizontal joints - No Traffic / No Water Immersion (*includes ceilings and soffits*)

Table 2: Exterior horizontal joints – Traffic and No Water Immersion

Table 3: Horizontal exterior joints – Traffic and Water Immersion

Table 4: Interior vertical and horizontal joints – No Traffic (including ceilings)

Table 5: Interior horizontal joints - Traffic

Table 6: Interior mildew-resistant vertical and horizontal joints – No Traffic

Table 7: Weather Barrier Sealant for primary seal to peel-n-stick fenestration flashings

Table 8: Interior vertical and horizontal joints - Security Sealants

Table 1: Exterior vertical and horizontal joints - No Traffic or Water Immersion *(includes ceilings and soffits)*

Substrates	Joint Type	Sealant Type	Notes
Cast in place concrete Plant and site precast architectural concrete units Unit masonry - Brick, CMU Concrete, Stone Stone Cladding Stucco and EIFS Metal Panels	Construction Joints Contraction joints Expansion Joints	JS-1, JS-2, JS-10, JS-11	Perform adhesion, compatibility and stain testing where applicable

Table 2: Exterior horizontal joints – Traffic and No Water Immersion

Substrates	Joint Type	Sealant Type	Notes
Cast in place concrete slabs, including steps Brick pavers, including steps Plant precast architectural concrete paving units, including steps Stone paving units, including steps Ceramic and stone tile	Joints between units and control joints	JS-13, JS-14, JS-18	Perform adhesion, compatibility and stain testing where applicable
	Expansion Joints	JS-14	
	Isolation joints	JS-05, JS-06, JS-07, JS-18	

Table 3: Horizontal exterior joints – Traffic and Water Immersion

Substrates	Joint Type	Sealant Type
Pedestrian Plazas	Control Joints	JS-15, JS-16, JS-17, JS-18
	Expansion Joints	See Section 07 95 00 Expansion Control
	Isolation Joints	JS-15, JS-16, JS-17, JS-18

Table 4: Interior vertical and horizontal joints – No Traffic *(includes ceilings)*

Substrates	Joint Type	Sealant Type
Exposed interior surfaces of exterior walls (masonry, concrete, partitions) Ceramic and stone tile	Control Joints	JS-12, JS-30
	Expansion Joints	See Section 07 95 00 Expansion Control
Between interior wall surfaces and frames of interior doors, windows and elevator entrances	Perimeter Joint (not expansion)	JS-12, JS-30
	Expansion Joints	See Section 07 95 00 Expansion Control
Aluminum thresholds and sill plates	Concealed Mastic	JS-40

Table 5: Interior horizontal joints - Traffic

Substrates	Joint Type	Sealant Type	
Cast-in-place concrete slabs	Control Joints	JS-20	
	Expansion Joints	JS-5, JS-6, JS-7, JS-18	Perform adhesion, compatibility and stain testing
Stone flooring (not tile) Brick flooring Ceramic and stone tile flooring	Control Joints	JS-5, JS-6, JS-7, JS-12, JS-14, JS-18	
	Expansion Joints	See Section 07 95 00 Expansion Control	

Table 6: Interior mildew-resistant vertical and horizontal joints – No Traffic

Substrate	Joint Type	Sealant Type
Plumbing fixtures and adjoining walls, floors and	Joints between fixture and adjacent surface	JS-8
Ceramic and stone tile	Control joints	JS-8
	Joints at inside corners, vertical and horizontal	JS-8
	Expansion joints	See Section 07 95 00 Expansion Control

Table 7: Weather Barrier Sealant for primary seal to peel-n-stick fenestration flashings

Substrate	Joint Type	Sealant Type
Peel-n-stick fenestration flashing	Primary seal in rough openings	JS-9

Table 8: Interior vertical and horizontal joints - Security Sealants

Substrates	Joint Type	Sealant Type
Between interior wall surfaces and frames of interior door, windows, elevators, masonry, concrete and partitions	Control Joints	JS-19, JS-20
	Expansion Joints	See Section 07 95 00 Expansion Control

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. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant including dust, paints, old sealants, oil, grease, waterproofing, water repellents, water, surface dirt and frost.

    a. Exception: Permanent protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer.

2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.

    a. Remove laitance and form-release agents from concrete.
    b. Remove loose particles by vacuuming or blowing out joints with oil-free compressed air.

3. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

    a. When ambient or surface temperatures are below 40 degrees F, use solvents that aid in evaporating surface frost (i.e., IPA or MEK). Confirm with joint sealant manufacturer.

B. Masking Tape: Use masking tape to prevent contact of prime or sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint sealant.

C. Joint Priming: Prime joint substrates where recommended by joint sealant manufacturer or as indicated by preconstruction joint sealant substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications and conditions indicated.

C. Backer Rod: Install backer rod types previously outlined to support sealant during application and at location required to produce proper width to depth dimension for optimal joint sealant performance. Backer rod is always applied after priming.

1. Do not leave gaps between ends of sealant backer rod
2. Do not stretch, twist, puncture, or tear backer rod
3. Remove open cell backer rod that has become wet before sealant application and replace with dry backer rod.

D. Bond-breaker: Install bond-breaker tape behind sealants where backer rod is not able to be used.

E. Apply Sealant: If primer is used, wait until primer has dried, so there is no chance of cure inhibition. Install sealants at the same time backer rod is installed using proven techniques approved by the sealant manufacturer and comply with the following:

1. Place sealants so they directly contact and fully wet-out the joint substrate.
2. Application of sealant should be uniform and exhibit the correct width-to-depth ratio to allow the sealant to optimally perform as outlined by the manufacturer.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning begins, tool sealant according to requirements below to displace air pockets, force sealant into the joint face for optimal adhesion, and provide a smooth uniform bead.

1. Use masking tape to protect surfaces adjacent to recessed tooled joints.
2. Dry tooling is the preferred technique.
3. Provide joint profile per ASTM C1193, unless otherwise indicated
4. Provide recessed joint profile in traffic areas per ASTM C1193, unless otherwise indicated.
5. Remove excess sealant from surfaces adjacent to joints using sealant manufacturer approved cleaning agents and techniques.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint sealant adhesion to joint substrates as follows:

1. Arrange for test to be conducted by joint sealant manufacturer’s technical representative.

a. Test Method: Test joint sealants according to Field-Applied Sealant Joint Hand Pull Tab in ASTM C1193.

1) Perform 5 sealant adhesion tests for the first 1,000 feet of joint length for each kind of sealant and joint substrate.
2) Perform one test for each 1,000 feet of joint length thereafter or one test per each floor.
3) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

2. Manufacturer authorized representative to provide site observation reports as to whether sealant adhesion tests passed or failed for all adhesion tests.

3. Installer is to notify General Contractor of any sealant failure and manufacturer approved remedies.

   a. Remove sealants that fail to conform to Project requirements or adhere to joint substrates.
   b. Retest failed areas until test results prove sealants comply with Project requirements.

4. After testing, repair the sealant following same procedure originally used to seal joint.

3.5 CLEANING

A. Clean off excess sealant adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by joint sealant manufacturers.

3.6 PROTECTION

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

END OF SECTION 07920

SECTION 08111 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Division 08 Section “Flush Wood Doors”.
3. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
4. Division 08 Section "Door Hardware".
5. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.
6. Division 26 "Electrical" Sections for electrical connections including conduit and wiring for door controls and operators installed on frames with factory installed electrical knock out boxes.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
3. Smoke Control Door Assemblies: Comply with NFPA 105.

    a. Smoke "S" Label: Doors to bear “S” label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.

D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.

E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. CECO Door Products (C).
2. Curries Company (CU).
3. Steelcraft (S).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Exterior Doors: Face sheets fabricated of commercial quality hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard polyurethane. Where indicated, provide doors fabricated as thermal-rated assemblies with a minimum R-value of 3.2 or better.
3. Core Construction: Manufacturer's standard vertical steel-stiffener core. Minimum 22 gauge steel-stiffeners at 6 inches on-center construction attached by spot welds spaced not more than 5" on centers. Spaces between stiffeners filled with fiberglass insulation (minimum density 0.8#/cubic ft.).

4. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 16 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel.
2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
3. Core Construction: Manufacturer's standard vertical steel-stiffener core. Minimum 22 gauge steel-stiffeners at 6 inches on-center construction attached by spot welds spaced not more than 5" on centers. Spaces between stiffeners filled with fiberglass insulation (minimum density 0.8#/cubic ft.).

    a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.

4. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 16/18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

D. Manufacturers Basis of Design:

1. Curries Company (CU) - Polystyrene Core - 707 Series.
2. Curries Company (CU) - Polyurethane Core - 707 Series.
3. Curries Company (CU) - Steel-stiffened - 747 Series

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Exterior Frames: Fabricated of hot-dipped zinc coated steel that complies with ASTM A 653/A 653M, Coating Designation A60.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
4. Manufacturers Basis of Design:

    a. Curries Company (CU) – M Series.

C. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
4. Manufacturers Basis of Design:

    a. Curries Company (CU) - M Series.

D. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.

E. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 HOLLOW METAL PANELS

A. Provide hollow metal panels of same materials, construction, and finish as specified for adjoining hollow metal components.

2.7 LOUVERS

A. Metal Louvers: Door manufacturer's standard metal louvers unless otherwise indicated.

1. Blade Type: Vision proof inverted V or inverted Y.

2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.

1. Manufacturers: Subject to compliance with requirements, provide door manufacturers standard louver to meet rating indicated.
2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.8 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.9 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.10 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:

1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
5. Electrical Raceways: Provide hollow metal doors to receive electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through-wire transfer hardware or wiring harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware". Wire nut connections are not acceptable.

D. Hollow Metal Frames:

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Electrical Thru-Wiring: Provide hollow metal frames receiving electrified hardware with loose wiring harness (not attached to open throat components or installed in closed mullion tubes) and standardized Molex™ plug connectors on one end to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electric through-wire transfer hardware or wiring harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".
9. Electrical Knock Out Boxes: Factory weld 18 gauge electrical knock out boxes to frame for electrical hardware preps; including but not limited to, electric through wire transfer hardware, electrical raceways and wiring harnesses, door position switches, electric

strikes, magnetic locks, and jamb mounted card readers as specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware".

a. Provide electrical knock out boxes with a dual 1/2-inch and 3/4-inch knockouts.
b. Conduit to be coordinated and installed in the field (Division 26) from middle hinge box and strike box to door position box.
c. Electrical knock out boxes to comply with NFPA requirements and fit electrical door hardware as specified in hardware sets in Division 08 Section "Door Hardware".
d. Electrical knock out boxes for continuous hinges should be located in the center of the vertical dimension on the hinge jamb.

10. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
11. Jamb Anchors: Provide number and spacing of anchors as follows:

a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1) Two anchors per jamb up to 60 inches high.
2) Three anchors per jamb from 60 to 90 inches high.
3) Four anchors per jamb from 90 to 120 inches high.
4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

1) Three anchors per jamb up to 60 inches high.
2) Four anchors per jamb from 60 to 90 inches high.
3) Five anchors per jamb from 90 to 96 inches high.
4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

12. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.11 STEEL FINISHES

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).

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

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and

secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 08111

SECTION 08210 – FLUSH WOOD DOORS

PART 1 – GENERAL

1.01 SUMMARY

A. RELATED DOCUMENTS

1. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 specification sections apply to this section.

B. SECTION INCLUDES

1. Work under this section comprises of furnishing solid core doors with wood veneer faces, light frames, factory fitting and machining and field finishing for fire labeled and non labeled flush wood doors.

1.02 REFERENCES

A. STANDARDS
1. NFPA-80-1995 – Fire Doors and Windows
2. NWWDA I.S. 1-A-97 – National Wood Window and Door Association
3. WDMA – Wood Door Manufacturer's Association
4. UL10C - Standard for Positive Pressure Fire Tests of Door Assemblies

B. CODES
1. NFPA-101-1994 – Life Safety Code
2. UBC 1997 - Uniform Building Code
3. ANSI-A117.1 – Accessible and Usable Buildings and Facilities.
4. ADA – Americans with Disabilities Act

1.03 SUBMITTALS

A. GENERAL REQUIREMENTS
1. Submit copies of the hollow metal door and frame shop drawings in accordance with Division 1, General Requirements.

B. PRODUCT DATA
1. Submit shop drawings showing fabrication and installation of flush wood doors. Include details of door elevations, details of construction, location and installation requirements of door hardware.

C. SHOP DRAWINGS
1. Provide a schedule of doors and frames using same reference numbers for details and door openings as those on the contract documents. Shop drawings should include the following information:
   a. Door core material.
   b. Mortises and reinforcements.
   c. Glazed and louvered openings and material.
   d. Mounting locations of standard hardware.

D. SAMPLES
1. Upon request submit the following samples:
   a. Corner sections of doors approximately 8" x 10" with door faces and edgings representing the typical range of color and grain for each species of veneer and solid lumber required.
   b. Frames for light openings, 6" long, for each material, type, and finish required.

1.04 QUALITY ASSURANCE

A. SUBSTITUTIONS
   1. All substitution requests must be submitted within the procedures and time frame as outlined in Division 1, General Requirements. Approval of products is at the discretion of the architect and his consultant.
B. MANUFACTURER QUALIFICATIONS
   1. Manufacturer shall be a member in good standing of the National Wood Window and Door Association (NWWDA.)
   2. Obtain wood doors from a single manufacturer to ensure uniformity in quality of appearance and construction. All material supplied for this project to conform to NWWDA I.S. 1-A-97 for premium grade wood doors.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of NWWDA pamphlet “How to Store, Handle, Finish, Install and Maintain Wood Doors,” as well as manufacturer's written instructions. Doors are to be shipped from manufacturer in individual polybags, and shall be inspected immediately upon arrival at jobsite for any damage of defects.
B. Identify each door with individual opening numbers that correlate with designation system used on shop drawings and contract drawings for door, frames and hardware. Use only temporary, removable, or concealed markings.
C. Do not deliver or install doors until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy level in storage and installation areas.

1.06 WARRANTY

A. Warranties shall be in addition to, and not a limitation of other rights the owner may have under the contract documents.

B. Submit written warranty on manufacturer’s standard form signed by the manufacturer agreeing to replace or repair defective doors which have:
   1. De-lamination in any degree.
   2. Warp or twist of ¼” or more in any 3’ x 6” x 8’ plane of door face.
   3. Telegraphing of stile, rail or core through face to cause surface variation in excess of 1/100” in any 3” spans.
C. Contractor shall replace or refinish doors where contractor’s work contributed to rejection or voiding of manufacturer’s warranty.
D. Solid core interior doors shall be warranted for the life of their installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements, provide flush wood doors by one of the manufacturers as listed.

2.02 DOORS

A. GENERAL REQUIREMENTS

1. Grade: Premium Grade A Faces with manufacturer's standard two (2) or three (3) ply faces.
2. Faces: CHVG Aler slip match, minimum 1/50" thick after finish sanding.
3. Stiles: Doors shall have matching hardwood outer stile edge, 9/16" minimum before trim. Overall stiles to be 1 3/8" after trim.

B. NON RATED AND 20 MINUTE DOORS
1. Supply particleboard core complying with ANSI-A208.1, Grade 1-LD-2 and NWWDA I.S. 1-A, bonded to door faces, stiles and rails. Use minimum adhesive Type II for interior doors as outlined in NWWDA I.S. 1-A-7.
   a. Algoma: Super Novodor/FD 1/3
   b. Graham: GPD
   c. Weyerhaeuser: DPC/DFP

2. Provide wood blocking at particleboard-core doors as follows:

   a. Provide 5" top-rail blocking, at doors indicated to have closers.
   b. Provide 5" mid-rail blocking, at doors indicated to have exit devices.

2.03 FINISHING

A. **Factory finish**: See Section 09900 - Painting for finishing.

2.04 LIGHT FRAMES

A. Provide manufacturer's standard metal light frame formed of 18-gauge, cold-rolled steel sheet, factory primed and approved for use in doors of fire rating indicated.

2.05 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements of NFPA 80 for fire-rated doors.

Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
2. Premachine metal astragals and formed-steel edges for hardware for pairs of fire-rated doors.

B. Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.

1. Trim openings with moldings of material and profile indicated

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine installed door frames before hanging doors.

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
2. Reject doors with defects.

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

3.02 INSTALLATION

A. For hardware installation, see Division 8 Section "Door Hardware."

B. Install wood 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.

C. Align factory fitted doors in frames for uniform clearance at each edge.

3.03 ADJUSTING AND PROTECTING

A. Rehang or replace doors that do not swing or operate freely.

B. Refinish or replace doors damaged during installation.

C. Protect doors as recommended by door manufacturer to ensure that wood doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08210

SECTION 08625 – Tubular Daylighting Device

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Tubular daylighting device, consisting of roof dome, reflective tube, and diffuser assembly; configuration as indicated on the drawings.

1.2 RELATED SECTIONS

A. Division 07 - Flashing: Metal flashings.

B. Division 08 - Metal Framed Skylights.

1.3 REFERENCES

A. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008a.

C. ASTM A 463/A 463M - Standard Specification for Steel Sheet, Aluminum Coated, by the Hot Dip Process; 2006.

D. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized), by the Hot Dip Process; 2007.

E. ASTM E 283 - Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.

F. ASTM E 308 - Standard Practice for Computing the Colors of Objects by Using the CIE System; 2006.

G. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors; 2002.

H. ASTM E 547 - Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain walls by Cyclic Air Pressure Difference; 2000.

I. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.

J. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricane.

K. ASTM D 635 - Test Method for Rate of Burning and/or Extent of Time of Burning of Self-Supporting Plastics in a Horizontal Position; 2006.

L. ASTM D-1929 - Test Method for Ignition Properties of Plastics; 1996 (2001).

M. UL 181 - Factory Made Air Ducts and Air Connectors

N. ICC AC-16 - Acceptance Criteria for Plastic Skylights; 2008.

O. Florida Building Code TAS 201 – Impact Test Procedures.

P. Florida Building Code TAS 202 – Criteria for Testing Impact and Non Impact Resistant Building Envelope Components Using Uniform Static Air Pressure Loading.

Q. Florida Building Code TAS 203 – Criteria for Testing Products Subject to Cyclic Wind Pressure Loading

1.4 PERFORMANCE REQUIREMENTS

A. Completed tubular daylighting device assemblies shall be capable of meeting the following performance requirements:
   1. Air Infiltration Test: Air infiltration will not exceed 0.30 cfm/sf aperture with a pressure delta of 1.57 psf across the tube when tested in accordance with ASTM E 283.
   2. Water Resistance Test: No uncontrolled water leakage at 10.5 psf pressure differential with water rate of 5 gallons/hour/sf when tested in accordance with ASTM E 547.
   3. Uniform Load Test:
      a. No breakage, permanent damage to fasteners, hardware parts, or damage to make daylighting system inoperable or cause excessive permanent deflection of any section when tested at a Positive Load of 150 psf (7.18 kPa) or Negative Load of 70 psf (3.35 kPa).
      b. All units shall be tested with a safety factor of (3) for positive pressure and (2) for negative pressure, acting normal to plane of roof in accordance with ASTM E 330.
   4. Fire Testing:
      a. When used with the Dome Edge Protection Band, all domes meet fire rating requirements as described in the 2006 International Building Code.
      b. Self-Ignition Temperature - Greater than 650 degrees F per ASTM D-1929.
      c. Smoke Density - Rating no greater than 450 per ASTM Standard E 84 in way intended for use. Classification C.
      d. Rate of Burn and/or Extent - Maximum Burning Rate: 2.5 inches/min (62 mm/min) Classification CC-2 per ASTM D 635.
      e. Rate of Burn and/or Extent - Maximum Burn Extent: 1 inch (25 mm) Classification CC-1 per ASTM D 635.

1.5 SUBMITTALS

A. Submit under provisions of Division 01.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings. Submit shop drawings showing layout, profiles and product components, including anchorage, flashings and accessories.

D. Verification Samples: As requested by Architect.

E. Test Reports: Independent testing agency or evaluation service reports verifying compliance with specified performance requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Engaged in manufacture of tubular daylighting devices for minimum 20 years.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. Daylighting Device: Manufacturer's standard warranty for 10 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Solatube International, Inc., which is located at: 2210 Oak Ridge Way ; Vista, CA 92081; Toll Free Tel: 888-765-2882; Tel: 760-477-1120; Email: request info (commsales@solatube.com); Web: www.solatube.com

B. Requests for substitutions will be considered in accordance with provisions of Division 016.

TUBULAR DAYLIGHTING DEVICES **(Coordinate with Gary Dvorak, Architectural Engineering/Technical Sales, 720.301.0490, www.solargreen.solatubecommercial.com, 80 Inverness Dr E., Englewood, CO 80112, C: 720.301.0490)**

2.2

A. Tubular Daylighting Devices General : Transparent roof-mounted skylight dome and self-flashing curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces; complying with ICC AC-16.

B. SolaMaster Series: Solatube Model 330 DS-O Open Ceiling, 21 inch (530 mm) Daylighting System:
   1. Roof Dome Assembly: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
      a. Glazing: Type DA, 0.143 inch (3.7 mm) minimum thickness injection molded acrylic classified as CC2 material; UV inhibiting (100 percent UV C, 100 percent UV B and 98.5 percent UV C), impact modified acrylic blend.
   2. LightTracker Reflector, made of aluminum sheet, thickness 0.015 inch (0.4 mm) with Spectralight Infinity. Positioned in the dome to capture low angle sunlight.
   3. Roof Flashing Base:
      a. One Piece: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube. Sheet steel, corrosion resistant conforming to ASTM A 653/A 653M or ASTM A 463/A 463M, 0.028 inch (0.7 mm) thick.

1) Base Style: Type F8, Self mounted, 8 inches (203 mm) high.

4. Tube Ring: Attached to top of base section; 0.090 inch (2.3 mm) nominal thickness injection molded high impact PVC; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing.
5. Tube Ring Seal: Attached to the base of the dome ring; butyl glazing rope, 0.24 inch (6 mm) diameter; to minimize air infiltration.
6. Dome Seal: Adhesive backed weatherstrip, 0.63 inch (16 mm) tall by 0.28 inch (7 mm).
7. Reflective Tubes: Aluminum sheet, thickness 0.018 inch (0.5 mm).
   a. General:
      1) Interior Finish: Spectralight Infinity high reflectance specular finish on exposed reflective surface. Specular reflectance for visible spectrum (400 nm to 760 nm) greater than 99 percent. Total solar spectrum reflectance (400 nm to 2500 nm) less than 80.2 percent.
      2) Color: a* and b* (defined by CIE L*a*b* color model) shall not exceed plus 2 or be less than minus 2 as determined in accordance to ÅSTM E 308.
   b. Top Tube Angle Adapter and Bottom Top Tube Angle Adapter Kit, Type AK:
      1) Reflective 45 degree adjustable top and bottom angle adapters (one each), 16 inches (406 mm) long
8. Diffuser Assemblies for Tubes Not Penetrating Ceilings (Open Ceiling): Solatube Model 330 DS-O. 21 inch (530 mm) diameter diffuser attached directly to bottom of tube.
   a. Lens: Type L2, Prismatic lens designed to maximize light output and diffusion. Visible Light Transmission shall be greater than 90 percent at 0.100 inch (2.5 mm) thick. Classified as CC2.
   b. Diffuser Seal: Open cell foam, acrylic adhesive backed, 0.75 inch (19 mm) wide by 0.125 inch (3.2 mm) thick to minimize condensation and bug, dirt and air infiltration per ÅSTM E 283.
   c. Diffuser Trim Ring: Injection molded acrylic. Nominal wall thickness 0.172 inches (4.4 mm).
9. Catalog Number: S330 DS-O-DA-F8-AK-L2

2.3 ACCESSORIES

A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.

B. Suspension Wire: Steel, annealed, galvanized finish, size and type for application and ceiling system requirement.

C. Sealant: Polyurethane or copolymer based elastomeric sealant as provided or recommended by manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's printed instructions.

B. After installation of first unit, field test to determine adequacy of installation. Conduct water test in presence of Owner, Architect, or Contractor, or their designated representative. Correct if needed before proceeding with installation of subsequent units.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
3. Division 08 Section “All-Glass Entrances”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.2303

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
b. Complete (risers, point-to-point) access control system block wiring diagrams.
c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01,

Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

   a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

   a. McKinney (MK) - TA/T4A Series, 5 knuckle.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

   a. Pemko (PE).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets with a 1-year warranty. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

    a. McKinney (MK) - QC (# wires) Option.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

    a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

    a. McKinney (MK) - QC-C Series.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Manufacturers:

    a. Rockwood (RO).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls, where applicable, shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

6. Manufacturers:

    a. Rockwood (RO).

C. Locking Pull System: Post-mount style door pulls with integrated deadbolt locking system in type and design as specified in the Hardware Sets. Pulls available in multiple head, floor, or combination locking options, with outside keyed rim cylinder operation and inside turn piece activation. Mounting applications for aluminum, glass, steel and wood doors, with customized sizing and configuration options. Locking pulls shall be provided with a 10” clearance from the finished floor on the cylinder side to accommodate wheelchair accessibility.

1. Manufacturers:

    a. Rockwood (RO) - LP Series.

D. Flat Latch Locking Pulls: Post-mount style door pulls with integrated flat latch locking system in type and design as specified in the Hardware Sets. Full and half height with latching at top of door. Option for horizontal push bar. Mechanical or electric strike release as specified. Dogging and ADA thumbturn included. Customized sizing and configuration options.
1. Manufacturers:

    a. Rockwood (RO) - FL Series.

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

1. Manufacturers:

    a. Match Existing, Field Verify.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.

4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Match Facility Standard.

C. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

D. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

E. Construction Keying: Provide construction master keyed cylinders.

F. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Heavy duty mortise locks shall have a ten-year warranty.

2. Where specified, provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180-degree viewing angle with protective covering to prevent tampering.

3. Manufacturers:

a. Sargent Manufacturing (SA) - 8200 Series.

B. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.

1. Vertical Impact: Exceed 100 vertical impacts (20 times ANSI/BHMA A156.2 requirements).

2. Furnish with solid cast levers, standard 2 3/4” backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.

3. Locks are to be non-handed and fully field reversible.

4. Manufacturers:

    a. Sargent Manufacturing (SA) - 10X Line.

2.7 ELECTROMECHANICAL LOCKING DEVICES

A. Electromechanical Cylindrical Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical cylindrical locksets, electrified locksets to be of type and design as specified below.

1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2. Manufacturers:

    a. Sargent Manufacturing (SA) – 10XG70/71 Series.

2.8 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.9 ELECTRIC STRIKES

A. Heavy-Duty Electric Strikes: Electric strikes conforming to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire rated openings designed to accommodate pre-load on fail secure models. Strikes shall be of stainless steel construction tested to a minimum of 1500 pounds of static strength and 70 foot-pounds of dynamic strength with a minimum endurance of 500,000 operating cycles. Provide strikes with 12 or 24 VDC capability with field selectable fail-secure/fail-safe and where specified provide latchbolt monitoring.

1. Manufacturers:

a. Adams Rite (AD) - 7400 Series.
b. HES (HS) - 7000/7500 Series.

B. Provide electric strikes with in-line power controller and surge suppressor by the same manufacturer as the strike with the combined products having a five year warranty.

2.10 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted closers with door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.

1. Manufacturers:

a. Norton Rixson (NO) - Unitrol Series.

C. Door Closers, Surface Mounted (Commercial Duty): ANSI/BHMA 156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard.

1. Manufacturers:

a. Norton Rixson (NO) - 8500 Series.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

a. Rockwood (RO).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where

they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Rockwood (RO).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.14 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

    a. Securitron (SU) - DPS Series.

B. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs.

1. Manufacturers:

a. Securitron (SU) - AQD Series.

2.15 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. 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 scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer’s Abbreviations:

1. GS - ASSA ABLOY Glass Solutions
2. MK - McKinney

3. PE - Pemko
4. RO - Rockwood
5. AD - Adams Rite
6. SA - SARGENT
7. OT - Other
8. HS - HES
9. NO - Norton
10. SU - Securitron

Hardware Sets

Set: 1.0
Doors: 01

1	Continuous Hinge	BSPFM__SLF-HD1		PE	
1	Deadlatch	4900	335	AD	
1	Lever Operator	4600 (deadlatches)	BSP	AD	
1	Cylinder	Verify & match existing - MK		OT	
1	Electric Strike	7400 ELX	335	AD	
1	SMART Pac Bridge Rectifier	2005M3		HS	
1	Push Bar & Pull	BF15747	BSP	RO	
1	Surface Closer	UNIJ8501	BSP	NO	
1	Threshold	252x2BSPFG		PE	
1	Weatherseal	Door manufacturer		OT	
1	Sweep	345BSPNB		PE	
1	Wiring Harness	QC-C1500P		MK	
1	Card Reader	By security contractor		OT	
1	Remote Release	By security contractor		OT	
1	Door Position Switch	DPS		SU	
1	Power Supply	AQD as required		SU	
1	Cylinder Guard	MS4043	119	AD	

Notes: Door is normally closed and locked. Exterior access by presenting a valid credential to reader or by remote release at Reception, momentarily releasing electric strike for entry. Free egress at all times.

Set: 2.0
Doors: 14

1	Continuous Hinge	BSPFM__SLF-HD1		PE	
1	Deadlatch	4900	335	AD	
1	Lever Operator	4600 (deadlatches)	BSP	AD	
1	Cylinder	Verify & match existing - MK		OT	
1	Electric Strike	7400 ELX	335	AD	
1	SMART Pac Bridge Rectifier	2005M3		HS	
1	Push Bar & Pull	BF15747	BSP	RO	
1	Surface Closer	UNIJ8501	BSP	NO	
1	Threshold	252x2BSPFG		PE	
1	Weatherseal	Door manufacturer		OT	
1	Sweep	345BSPNB		PE	

1	Wiring Harness	QC-C1500P		MK
1	Card Reader	By security contractor		OT
1	Door Position Switch	DPS		SU
1	Power Supply	AQD as required		SU
1	Cylinder Guard	MS4043	119	AD

Notes: Door is normally closed and locked. Exterior access by presenting a valid credential to reader, momentarily releasing electric strike for entry. Free egress at all times.

Set: 3.0
Doors: 02

2	Door Rail/Patch	DRT-DRS/PFD Series per elevations	US32D	GS
1	Bottom Pivot	PV-ENDLOAD	AL	GS
1	Cylinder	Verify & match existing - MK		OT
1	Electric Strike	ESK-1600-SGL	US32D	GS
1	Locking Pull	FL3301DBU Code 03	US32D	GS
1	Concealed Closer	OHC-609-90NHO		GS
1	Arm	OHC-609-ARM		GS
1	Mounting Clip	OHC-609-MC		GS
1	Floor Stop	RM850	US32D	RO
1	Wiring Harness	QC-C1500P		MK
1	Card Reader	By security contractor		OT
1	Remote Release	By security contractor		OT
1	Power Supply	AQD as required		SU

Notes: Door is normally closed and locked. Exterior access by presenting a valid credential to reader or by remote release at Reception, momentarily releasing electric strike for entry. Free egress at all times. This material is provided by the glass door supplier under a separate specification section 084126 All Glass Entrances.

Set: 4.0
Doors: 15

2	Hinge, Full Mortise, Hvy Wt	T4A3786 NRP	US26D	MK
1	Electric Hinge, Hvy Wt	T4A3786-QC8	US26D	MK
1	Fail Secure Lock	LC RX 10XG71 LL	US26D	SA
1	Cylinder	Verify & match existing - MK		OT
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Wall Stop	403	US26D	RO
1	Threshold	271A		PE
1	Gasketing	S88BL		PE
1	Sweep	315CN		PE
1	Wiring Harness	QC-C1500P		MK
1	Card Reader	By security contractor		OT
1	Wiring Harness	QC-C___P through door to lever		MK
1	Power Supply	AQD as required		SU

Notes: Door is normally closed and locked. Exterior access by presenting a valid credential, momentarily unlocking lever for entry. Free egress at all times.

Set: 5.0
Doors: 16

6	Hinge, Full Mortise	TA2714 NRP	US26D	MK
1	Automatic Flush Bolt Set	2842/2942	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Storeroom Lock 3/4" latch	LC 41 10XG04 LL	US26D	SA
1	Cylinder	Verify & match existing - MK		OT
2	Surface Closer	8501	689	NO
2	Kick Plate	K1050 10" CSK BEV	US32D	RO
2	Wall Stop	403	US26D	RO
1	Gasketing	S44BL		PE
1	Meeting Edge Seal	S771C		PE

Set: 6.0
Doors: 03, 08

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Entry/Office Lock	LC 10XG05 LL	US26D	SA
1	Cylinder	Verify & match existing - MK		OT
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Wall Stop	403	US26D	RO
1	Gasketing	S44BL		PE

Set: 7.0
Doors: 04

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Indicator Privacy Lock	LB V21 8266 LNL	US26D	SA
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Mop Plate	K1050 6" CSK BEV	US32D	RO
1	Wall Stop	403	US26D	RO
1	Gasketing	S44BL		PE
1	Coat Hook	RM840	US32D	RO

Set: 8.0
Doors: 09

3	Hinge, Full Mortise	TA2314	US32D	MK
1	Indicator Privacy Lock	LB V21 8266 LNL	US26D	SA
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" CSK BEV	US32D	RO
1	Mop Plate	K1050 6" CSK BEV	US32D	RO
1	Wall Stop	403	US26D	RO
1	Gasketing	S44BL		PE
1	Coat Hook	RM840	US32D	RO

Set: 9.0
Doors: X01, X03, X04

1	Electric Hinge, Hvy Wt	T4A3786-QC8	US26D	MK
1	Fail Secure Lock	LC RX 10XG71 LL	US26D	SA
1	Cylinder	Verify & match existing - MK		OT
1	Wiring Harness	QC-C1500P		MK
1	Card Reader	By security contractor		OT
1	Wiring Harness	QC-C___P through door to lever		MK
1	Door Position Switch	DPS		SU
1	Power Supply	AQD as required		SU

Notes: Verify existing conditions to receive new hardware and card reader access.

Set: 10.0
Doors: X02

1	Storeroom Lock	LC 10XG04 LL	US26D	SA
1	Cylinder	Verify & match existing - MK		OT

Notes: Verify existing conditions to receive new lever lock.

Set: 11.0
Doors: XM1, XM2

1	Passage Latch	10XU15 LL	US26D	SA

Notes: Verify existing conditions to receive new passage lever set.

Set: 12.0
Doors: 05, 07, 10, 12

1	Sliding System	BLD-FT-01IS x soft close		PE
1	Dust Proof Strike	570	US26D	RO
1	Locking Pull	LP3301DBD ADA LC	US32D	RO
1	Cylinder	Verify & match existing - MK		OT

Set: 13.0
Doors: 06

2	Sliding System	BLD-FT-01IS x soft close		PE
2	Dust Proof Strike	570	US26D	RO
2	Locking Pull	LP3301DBD ADA (privacy)	US32D	RO

Set: 14.0
Doors: 11

1	Sliding System	BLD-FT-01IS x soft close		PE
2	Door Pull	RM3301-48 Mtg-Type 5HD MP	US32D	RO

Set: 15.0
Doors: 13

1 Hardware	Door manufacturer	OT

Set: 16.0
Doors: X05, X06

1 Hardware	Existing to remain	OT

END OF SECTION 087100

SECTION 08810 - GLAZING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Hollow metal panels and openings.
B. Insulating glass in Aluminum entrances.
C. Miscellaneous interior glazing
D. Insulating glass.

1.03 SUBMITTALS

A. Samples:
1. Submit 2 samples, 5 inches x 7 inches, of each type of glazing material. Samples of glazing compounds. Samples will be reviewed for appearance only.

1.04 QUALITY ASSURANCE STANDARDS

A. Flat Glass:
1. Shall comply with ASTM C1036 Standard Specification for Flat Glass, Type 1, Class 1 (clear) or Class 2 (tinted, heat-absorbing and light reducing) and Quality q3
2. ASTM C 1048 Heat Treated Flat Glass, Kind HS or FT (remove ASTM Standard C 1048 if annealed glass), Condition A (uncoated), B (spandrel glass, one surface coated), or C (other coated glass
   a. Heat Treated Flat Glass to be by horizontal (roller hearth) process with inherent rollerwave distortion parallel to the bottom edge of the glass as installed.
   b. Maximum peak to valley rollerwave 0.003” (0.08mm) in the central area and 0.008” (0.20mm) within 10.5” (267mm) of the leading and trailing edge.
   c. Maximum bow and warp 1/32” per lineal foot (0.79mm).
   d. All tempered architectural safety glass shall conform with ANSI Z97.1 and CPSC 16 CFR 1201.

B. Insulating Glass:
1. Shall comply with ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation.
   a. Units shall be certified for compliance by the IGCC in accordance with the above ASTM test method.
2. The unit overall thickness tolerance shall be -1/16” (1.59mm) / +1/32” (0.79mm). Unit constructed with patterned or laminated glass shall be +/-1/16” (1.59mm).
3. Shall comply with ASTM E 546 Standard Test Method for Frost Point of Sealed Insulating Glass Units
4. Shall comply with ASTM E 576 Standard Test Method for Frost Point of Sealed Insulating Glass Units in the Vertical Position
5. Sealed Insulating Glass Units to be double sealed with a primary seal of polyisobutylene and a secondary seal of silicone.
   a. The minimum thickness of the secondary seal shall be 1/16” (1.59mm).

b. The target width of the primary seal shall be 5/32” (3.97mm).
c. There shall be no voids or skips in the primary seal.
d. Gaps or skips between primary and secondary sealant are permitted to a maximum width of 1/16” (1.59mm) by maximum length of 2” (51mm) with gaps separated by at least 18” (457mm). Continuous contact between the primary seal and the secondary seal is desired.
e. Both primary and secondary sealant adhesion shall exhibit continuous, tenacious adhesion to both glass and spacer contact areas.

6. To provide a hermetically sealed and dehydrated space, lites shall be separated by an equal to a Super Spacer by TriSeal.

C. Coated Vision Glass:
1. Shall comply with ASTM C 1376 Standard for Pyrolytic and Vacuum Deposition Coatings on Glass
2. Coated products to be magnetically sputtered vacuum deposition (MSVD)
3. Edge Deletion – When low-e coatings are used within an insulating unit, coating shall be edge deleted to completely seal the coating within the unit.
a. The edge deletion should be uniform in appearance (visually straight) and remove 95% of the coating.

D. Ceramic Coated Glass Products:
1. Shall comply with ASTM C 1048 Standard Specification for Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated, Condition B
2. Silk-screen pattern should be no more than 0.0625” (1.59 mm) off parallel from locating glass edge and no more than 0.0125” (3.18 mm) from edges other than locating glass edge.
3. There shall be a maximum of a 0.03125” (0.79 mm) variation in dot, hole or line location.

5. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association "Glazing Manual" and "Sealant Manual".
6. Elastomeric Sealant Standard: Comply with ASTM C920 requirements for Type, Grade, Class and Uses.

B. Manufacturers:
1. Provide each type of glass and primary sealant/gasket from a single manufacturer with not less than 5 years of successful experience in the production of materials similar to those required.

C. Installer (Glazier):
1. Firm with not less than 5 years of successful experience in glazing work similar to required work.

1.05 DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer's instructions for shipping, handling, storing and protecting glass and glazing materials. Exercise exceptional care to prevent edge damage to glass, and damage/deterioration to coatings (if any) on glass.
1. Where insulating glass units will be exposed to substantial altitude changes, comply with insulating glass fabricator's recommendations for venting and sealing.

1.06 PROJECT/SITE CONDITIONS

A. Weather Conditions: Do not proceed with installation of liquid sealants under adverse weather conditions, or when ambient and substrate temperatures are below or above manufacturer's

recommended limitations for installation.

1.07 Warranties:

1. Provide a written 10-year warranty (vertical application) or 5-year warranty (sloped application) from date of manufacture for insulating glass. Warranty covers deterioration due to normal conditions of use and not to handling, installing, protecting and maintaining practices contrary to the glass manufacturer's published instructions.
2. Provide a written 5-year warranty from date of manufacture for fully tempered glass that has been Heat Soaked. Warrants that heat soaked tempered glass will not break spontaneously as a result of Nickel Sulfide (NiS) inclusions at a rate exceeding 0.5% (5/1000) for a period of five years from the date of manufacture.

1.08 MOCKUP

A. A construction mockup separate from the building is required for Owner/Architect review and approval. Refer to Drawings for size and inclusion of mockup materials. Mockup location within project site is to be coordinate before construction and it is to be maintained throughout construction for reference.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Approved Basic Manufacturers:
   1. Vitro Architectural Glass (formerly PPG)
   2. Guardian Industries
   3. Viracon

2.02 PRIME GLASS

A. Clear Float Glass:
   1. Type I, Class 1 (clear) Quality q3 (glazing select), Annealed, sized per ASTM 1300 and per current IBC on glass and glazing (Chapter 24).

2.03 LOW E GLASS

Clear Float Glass: Heat strengthened, coating on inner surface, inner and outer pane of insulating glass, 62% light transmittance.

2.04 INSULATING GLASS UNITS (note IG#1 is thermal glass and is a tempered thermal glass. It is the contractors final responsibility to coordinate all tempered glass locations per the current code and authority having jurisdiction)

a. Double-Glazed Sputter-Coated Insulating Glass Units:
   Conformance: ASTM E 2190, Class CBA.
   Outboard Lite: Sputter-coated OptiGray® float glass.
      a) Optigray® Float Glass: ASTM C 1036, Type 1, Class 2, Quality q3.
      b) Vacuum Deposition Sputtered Coating: ASTM C 1376.
      c) Coating on Surface No. 2: Solarban 70.
      d) Glass Thickness: 6 mm (1/4 inch).
      f) Heat Treatment: [Heat-strengthened, ASTM C 1048, Kind HS] [Tempered; ASTM C 1048, Kind FT; CPSC 16CFR-1201; ANSI Z 97.1].
   Air Space: 12 mm (1/2 inch) wide, hermetically sealed, dehydrated air space.
   Inboard Lite: Clear float glass.
      g) Annealed Clear Float Glass: ASTM C 1036, Type 1, Class 1, Quality q3.
      h) Glass Thickness: 6 mm (1/4 inch).
      j) Heat-Treatment: [None] [Heat-strengthened, ASTM C 1048, Kind HS] [Tempered; ASTM C 1048, Kind FT; CPSC 16CFR-1201; ANSI Z 97.1].
   Glass Unit Performance Characteristics:

k) Visible Light Transmittance: 46 percent
l) Visible Light Reflectance Outdoors: 9 percent
m) Winter U-Value Nighttime: 0.28
n) Summer U-Value Daytime: 0.27
o) Solar Heat Gain Coefficient: 0.23

Edge Seals: ASTM E 773, with aluminum spacers and silicone sealant for glass-to-spacer seals.
Sealant: Approved by glass manufacturer

2.05 HEAT TREATED (TEMPERED) GLASS

A. Provide prime glass of color and type indicated, which has been heat-treated to strengthen glass in bending, Kind FT (fully tempered) as specified, horizontally heat treated with minimal waviness or distortion at bottom edge of glass and free of tong marks.
B. Provide Kind FT glass where safety glass is indicated or where required by applicable laws and Codes.

2.06 COATED GLASS (N/A)

2.07 GLAZING SEALANTS AND TAPES

A. General:
   1. Provide black exposed glazing materials, unless another color is indicated, or unless another color is selected by Architect from manufacturer's standard colors.
   2. Provide hardness of materials as recommended by the manufacturer for the required application and condition of installation in each case. Provide only sealants and tapes which are known (proven) to be fully compatible with surfaces contacted, including glass products, seals of insulating glass units and glazing channel surfaces.
B. 1-Part Non Acid Curing Medium Modulus Silicone: (Use for exterior hollow metal and aluminum)
   1. Type S, Grade NS, Class 25, Uses NT, G, A, and as applicable to uses indicated, 0; and complying with tensile strength of not less than 45 nor more than 75 psi at 100% elongation when tested per ASTM D412 after 14 days at 77 degrees F and 50% relative humidity.
   2. Products: Provide one of the following or equal:
      a. "Dow Corning 795"; Dow Corning Corporation
      b. "Silpruf"; General Electric Corporation
      c. "Gesil"; General Electric Corporation
      d. "Spectrum 2"; Tremco, Inc.
C. 1-Part Acrylic Glazing Sealant: (Use for interior glazing of hollow metal or wood work.)
   1. Water-based, acrylic emulsion sealant; non-sag, mildew resistant, paintable; complying with ASTM C834.

2.08 MISCELLANEOUS GLAZING MATERIALS

A. Compatibility: Provide materials compatible with surfaces and sealants contacted in installation.
B. Setting Blocks: Neoprene, EPDM or silicone 80-90 Shore A durometer hardness, with proven compatibility with sealants used.
C. Edge Blocks: Neoprene, EPDM or silicone with proven compatibility with sealants used, of size, shape and hardness as recommended by glass and sealant manufacturers. Provide edge blocks to limit lateral movement of glass.
D. Cleaners, Primers and Sealants: Type recommended by sealant or gasket manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that framing and glazing channel surfaces, backing, and removable stop design are acceptable, that weep system is functioning and for effective sealing of joinery.

3.02 INSTALLATION

A. Performance:
   1 Watertight and airtight installation of each piece of glass is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and air-tight, deterioration of glazing materials and other defects in the work.

B. General:
   1. Protect glass from edge damage at all times during handling, installation and operation of the building.
   2. Glazing channel dimensions as shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate sealant thicknesses, with reasonable tolerance. The Glazier is responsible for correct glass size for each opening, within the tolerance and necessary dimensions established.
   3. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are shown or specified, and except where manufacturer's technical representatives direct otherwise.
   4. Comply with "Glazing Manual" and other applicable publications by Flat Glass Marketing Association except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.
   5. Inspect each piece of glass immediately before installation, and discard any which have observable edge damage or face imperfections.
   6. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Set with pattern, draw and bow oriented in the same direction as other pieces.

3.03 PREPARATION

A. Clean the glazing channel or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.

B. Apply primer or sealer to joint surfaces where recommended by sealant manufacturer.

3.04 GLAZING

A. General:
   1. Install setting blocks of proper size at quarter points of sill rabbet but not less than 6" from corner of glass to edge of setting block. Set blocks in thin course of the heel-based compound, if any.
   2. Install colored glass together with the insulating glass unit in opening as shown on drawings.
   3. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.
   4. Clean and trim excess glazing materials from the glass and stops or frames promptly after installation, and eliminate stains and discoloration.

B. Tape and Sealant Glazing:
   1. Cut glazing tape to length and set against permanent stop 3/16" below sight line. Butt tape at corners and daub joint with butyl sealant.
   2. Place setting blocks and rest glass pane on blocks and push against tape to attain full contact with glass perimeter.
   3. Place glazing tape on glass and install removable stop.
   4. Apply cap bead of medium modules silicone sealant along exterior and interior void to uniform line and with "wash" away from glass. Tool or wipe sealant with solvent for smooth appearance.

3.05. CURE, PROTECTION AND CLEANING

A. Cure glazing sealants and compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.

B. Protect exterior glass from breakage immediately upon installation, by attachment of crossed streamers to framing held away from glass. Do not apply markers of any type to surface of glass.
C. Remove nonpermanent markers and clean surfaces.
D. Remove and replace glass which is broken, chipped, cracked, abraded, or damaged in other ways during the construction period, including natural causes, accidents and vandalism.
E. Washing of glass is specified in Section 01770 - Closeout Procedures.

END OF SECTION 08810

SECTION 09216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Non-load bearing steel framing systems for interior gypsum board assemblies.
2. Suspension systems for interior gypsum ceilings, soffits, and grid systems.

B. Related Sections:

1. Division 05 - Cold Formed Metal Framing.
2. Division 07 - Thermal Insulation.
3. Division 07 - Vapor Retarders.
4 Division 07 - Joint Sealants.
5 Division 09 – Gypsum Board Assemblies.
6 Division 09 - Cementitious Backing Boards

1.3 DESIGN REQUIREMENTS

A. Design in accordance with American Iron and Steel Institute Publication “Specification for the Design of Cold-Formed Steel Structural Members”, except as otherwise shown or specified.

B. Design loads: 5 PSF minimum as required by the International Building Code.

1.4 SUBMITTALS

A. Product Data: For each type of product. – submit per provisions of Division 01.

B. Submit manufacturer’s certification of product compliance with codes and standards along with product literature and data sheets for specified products.

C. Evaluation Reports: Submit evaluation reports certified under an independent third part inspection program administered by an agency accredited by IAS to ICC-ES AC98 IAS Accreditation Criteria for Inspection Agencies.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Notify manufacturer of damaged materials received prior to installing.

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 in AISI's "Code of Standard Practice".

PART 2 - PRODUCTS

2.1 QUALITY ASSURANCE

A. Fire / Sound Test-Response Responsibilities: For fire-resistance rated assemblies that incorporate non-load bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by, and displaying a classification label from, an independent testing agency acceptable to the authority having jurisdiction.

1. Construct fire-resistance rated partitions in compliance with tested assembly requirements indicated in drawings.

2. Rated assemblies to be substantiated from applicable testing using the proposed products by Contractor.

3. Both metal framing & wallboard manufacturers must submit written confirmation that they accept the other manufacturer's product as a suitable component in the assembly. Acceptance is as follows:

   a. If installation of both products is proper, no adverse effect will result in the performance of one manufacturer's product by the other's products.

   b. Combining products can be substantiated by required assembly tests.

B. STC-Rated Assemblies: For STC rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Contractor shall provide effective, full time quality control over all fabrication and erection complying with the pertinent codes and regulations of government agencies having jurisdiction. Conduct pre-installation meeting to verify project requirements, substrate conditions, and manufacturer's installation instructions.

2.2 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C645-09 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C645-09 requirements for metal unless otherwise indicated.

2. Protective Coating: Comply with ASTM C645-09: roll-formed from hot-dipped galvanized steel; complying with ASTM A1003/A1003M and ASTM A653/A653M G40 (Z120) or

having a coating that provides equivalent corrosion resistance. A40 galvannealed products are not acceptable.

B. Steel Studs and Runners: ASTM C645-09.

1. "EQ" (Equivalent Gauge Thickness) Steel Studs and Runners:
Members that can show certified third party testing with gypsum board in accordance with ICC ES AC86 – 2010 (Approved February 2010 Effective March 1, 2010) need not meet the minimum thickness limitation or minimum section properties set forth in ASTM C645-09. The submission of a recognized evaluation report is acceptable to show conformance to this requirement.

a. Minimum Base-Steel Thickness: 0.015 inch (0.3810 mm), 0.019 inch (0.4826 mm), 0.030 inch (0.760 mm), 0.033 inch (0.8382 mm). Gauges are to be selected per minimum partition height requirements.

b. Depth: As specified on drawings.

C. Slip-Type Head Joints: Provide one of the following:

1. Single Long-Leg Runner System: ASTM C 645-09 top runner with 3 inch (51 mm) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging and spacer bar, with manufacturer's proprietary bridging and spacer bar, or cold-formed channel with clip angles located within 12 inches (305 mm) of the top of studs to provide lateral bracing.

2. Double-Runner System: ASTM C 645-09 top runners, inside runner with 3 inch (51 mm) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

D. Backing Plate: Proprietary fire-resistance-treated blocking and bracing in width indicated.

E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Steel Thickness: 0.0296 inch (0.75 mm).

F. Channel Bridging and Bracing: Steel, 0.0538 inch (1.37 mm) minimum base-metal thickness, with minimum 1 1/2-inch (13-mm) wide flanges.

G. U-Channel Bridging: Steel, 0.0538 inch (1.37 mm) minimum base-metal thickness, with minimum 1 1/2-inch (13-mm) wide flanges.

1. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38 by 38 mm), 0.0538-inch (1.37 mm) thick, galvanized steel.

H. Hat-Shaped, Rigid Furring Channels: ASTM C 645-09.

1. Minimum Base-Steel Thickness: 0.0179 inch (0.45 mm).
2. Depth: As indicated on Drawings.

I. Resilient Furring Channels: 1/2 inch (13 mm) deep, steel sheet members designed to reduce sound transmission.

1. Configuration: Asymmetrical.

J. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum uncoated-metal thickness of 0.018 inch (0.45 mm), and depth required to fit insulation thickness indicated.

K. Radius Framing: Steel sheet runner for non-load-bearing curves, bends, variable radii and arches using a work-hardened steel base strip.

1. Minimum Base-Steel Thickness: 0.0296 inch (0.75 mm).

2. Depth: As indicated on Drawings.

2.3 SUSPENSION SYSTEMS

A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062 inch (1.59mm) diameter wire, or double strand of 0.048 inch (1.21mm) diameter wire.

B. Hanger Attachments to Concrete:

1. Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.

a. Type: Per manufacturers recommended installation.

2. Powder-Actuated Fasteners: Suitable for application indicated, fabricated from corrosion-resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E 1190 by an independent testing agency.

C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch (4.12 mm) in diameter.

D. Carrying Channels: Cold-formed, commercial-steel sheet with a base-metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2 inch (13 mm) wide flanges.

1. Depth: Per manufacturers recommended installation.

E. Furring Channels (Furring Members):

1. Cold-Formed Channels: 0.0538-inch (1.37-mm) uncoated-steel thickness, with minimum 1/2 inch (13 mm) wide flanges, 3/4 inch (19 mm) deep.

2. Steel Studs and Runners: ASTM C645-09.

3. “EQ” (Equivalent Gauge Thickness) Steel Studs and Runners:
Members that can show certified third party testing with gypsum board in accordance with ICC ES AC86 – 2010 (Approved February 2010 Effective March 1, 2010) need not

meet the minimum thickness limitation or minimum section properties set forth in ASTM C645-09. The submission of a recognized evaluation report is acceptable to show conformance to this requirement.

a. Minimum Base-Steel Thickness: Per manufacturers recommended installation.

b. Traditional Flat Steel - Minimum Base-Steel Thickness: Per manufacturers recommended installation.

c. Depth: Per manufacturers recommended installation.

6. Hat-Shaped, Rigid Furring Channels: ASTM C 645-09, 7/8 inch (22 mm) deep.

a. Minimum Base-Steel Thickness: Per manufacturers recommended installation.

7. Resilient Furring Channels: 1/2 inch (13 mm) deep members designed to reduce sound transmission.

a. Configuration: Asymmetrical.

F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645-09, direct-hung system composed of main beams and cross-furring members that interlock.

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

a. Armstrong World Industries, Inc.; Drywall Grid Systems.

b. Chicago Metallic Corporation; Drywall Grid System.

c. USG Corporation; Drywall Suspension System.

2.4 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide one of the following:

1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.

2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

B. Coordination with Sprayed Fire-Resistive Materials:

1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling runners (tracks) to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches (610 mm) o.c.

2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.

2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.

3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.

4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches (406 mm) o.c. unless otherwise indicated.

2. Multilayer Application: 16 inches (406 mm) o.c. unless otherwise indicated.

3. Tile Backing Panels: 16 inches (406 mm)] o.c. unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.

2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

a. Install two studs at each jamb unless otherwise indicated.

b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.

c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.

a. Install fire-resistance-rated partitions using manufacturer's proprietary equivalent gauge studs in compliance with requirements of UL V450, UL V438, UL U419.

b. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

6. Curved Partitions:

a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.

b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of no fewer than two studs at ends of arcs, place studs 6 inches (150 mm) o.c.

E. Direct Furring:

1. Screw to wood framing.

2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

F. Z-Furring Members:

1. Erect insulation, specified in Division 07 Section "Thermal Insulation," vertically and hold in place with Z-furring members spaced 24 inches (610 mm) 600 mm o.c.

2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.

3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw-attach short flange of furring channel to web of attached channel. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.

G. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.5 INSTALLING SUSPENSION SYSTEMS

A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Hangers: 48 inches (1219 mm) o.c.

2. Carrying Channels (Main Runners): 48 inches (1219 mm) o.c.

3. Furring Channels (Furring Members): 16 inches (406 mm) o.c.

B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.

C. Suspend hangers from building structure as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter-splaying, or other equally effective means.

2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension

system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.

a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.

4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.

5. Do not attach hangers to steel roof deck.

6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.

7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.

8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.

E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.

F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09216

SECTION 09260 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A.Gypsum board work as shown on the drawings and in schedules.

B. The types of work required include the following:
   1. Gypsum board applied to metal support system.
   2. Gypsum board finishing (joint tape-and-compound treatment).
   3. Gypsum sheathing applied to metal support system.
   4. Drywall suspension system.
   5. Moisture resistant gypsum board.
   6. Sound attenuation blankets and sealants.

1.03 SUBMITTALS

A. Product Data:
   1. Submit manufacturer's data for joint compounds, acoustic sealants, acoustic insulation, cementitious backer units.

1.04 QUALITY ASSURANCE

A. Industry Standard:
   1. Comply with applicable requirements of ASTM C840 "Application and Finishing of Gypsum Board" by the Gypsum Association, except where more detailed or more stringent requirements are indicated including the recommendations of the manufacturer. Refer to ASTM C11 and GA505 for definitions of terms for gypsum board construction.

B. Other Standards:
   1. Comply with applicable requirements of Mountain States Bureau for Lath, Plaster, and Drywall, Inc.

C. Manufacturer:
   1. Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers or bundles, bearing brand name and identification of manufacturer. Store and protect in accordance with referenced standards. Handle gypsum boards to prevent damage to edges, ends and surfaces.

1.07 PROJECT/SITE CONDITIONS

A. Maintain ambient temperatures at not less than 40 degrees F. for non-adhesive attachment of gypsum board and 50 degrees F. for adhesive attachment and for the period of 48 hours before wallboard finishing, during installation and 48 hours after installation. Provide adequate ventilation and conform to ASTM C840.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. U.S. Gypsum Industries, Inc. (USG).
B. National Gypsum Company (Gold Bond).
C. CertainTeed
D. Or approved equal

2.02 METAL SUPPORT MATERIALS

A. General:
   1. To the extent not otherwise indicated, comply with ASTM C645 and C754, for metal system supporting gypsum wallboard work.
B. Ceilings:
   Grid Suspension System for Interior Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Armstrong World Industries, Inc.; Furring Systems/Drywall.
      b. Chicago Metallic Corporation; Fire Front 630 System.
      c. USG Interiors, Inc.; Drywall Suspension System.
   2. Materials: USG Flat Drywall Suspension System.
      a. Main Tees: 1-1/2 inch DGLW-26.
      b. Cross Members: 1-1/2 inch DGLW-424.
      c. Furring Channels: 7/8 inch high x 1-1/2 inch wide face, DGCL-4.
      d. Accessory Cross tees: DGLW-224 and DGLW-424.
      e. Wall Moldings: DGCM-16; DGCM-25.
      f. Accessories: Transition Clip DGTC-90; Splice Clip DGSC-180.
C. Furring Members:
   1. ASTM C645; 25 (0.0179") gage, hat-shaped, 0.875" depth.
D. Partitions:
   1. Studs: Refer to Non Structural Metal Framing for requirements
   2. Furring: ASTM C645; 25 gage (0.0179") x 1.625" and 2.5".
   3. At single door jambs and at tile backing use 20 gage (0.0329") or heavier studs.
   4. At double doors use 16 gage studs.
   5. Runners: Match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.
   6. Stud System Accessories: Provide stud manufacturer's standard clips, shoes, ties, reinforcements, fasteners and other accessories as needed for a complete stud system.
   7. Deflection Limit: L/240.
E. Fasteners:
   1. Type and size recommended by furring manufacturer for the substrate and application indicated. Conform to ASTM C1002 for screws.

2.03 BOARD MATERIALS - See drawings for product locations

A. Exposed Gypsum Board
   1. ASTM C36, standard taper long edges, 0.625" thick except where otherwise indicated, Type X 4 ft. width by maximum lengths to minimize end joints.
B. Moisture Resistant Gypsum Board:
   1. ASTM C630, 0.625 " thick, ends square cut, tapered and beveled edges.
C. Cement Board:
   1. 0.625 thick,ends square cut, tapered and beveled edges
D. Exterior Gypsum Soffit Board: ASTM C 932, with manufacturer's standard edges.
   1. Core: regular type 5/8 inch, Type X.
E. Glass-Mat Gypsum Sheathing Board: ASTM C 1177; moisture resistant, 0.625" thick, ends square cut, square edges.

1. “Dens-Glass Gold” by G-P Gypsum Corp.
2. “Dens-Shield Tile Backer” by G-P Gypsum Corp at all ceramic tile and FRP locations
3. “Dens-Armor Plus Interior Panels” by G-P Gypsum Corp at wet wall locations.

F. Impact Resistant VHI Gypsum Wall Board: ASTM C 36 or Fed Spec SS-L-30, Type III Gypsum-Cellulose Core, 5/8 inch thick, ends square cut, edges tapered for taping,

G. Accessories:
   1. Trim Accessories: ASTM C840 as follows:
      a. External Corners: CB-118 x 118.
      b. Termination Exposed to View: LC58.
      c. Termination Abutting Another Material: L-58.
      d. Expansion Control Joints: No. 093, U.S. Gypsum, E-Z Strip, Gold Bond or approved equal.
   2. Joint Treatment: Comply with ASTM C475, ASTM C840 and recommendations of both board, reinforcing tape and joint compound manufacturers.
      a. Compounds: Chemical drying type, for first 2 coats and vinyl type top coat specially formulated for finish topping.
      b. Joint reinforcing tape: 2-1/16' wide paper tape.

2.04 MISCELLANEOUS MATERIALS

A. Provide auxiliary materials for gypsum wall board work of the type and grade recommended by the manufacturer of the gypsum board.

B. Adhesives and Fasteners:
   1. Laminating Adhesive: Special adhesive or joint compound specifically recommended for laminating gypsum boards.
   2. Spot Grout: ASTM C475, setting type joint compound for spot grouting hollow metal frames.
   3. Gypsum Board Screws: ASTM C1002.

C. Sealants and Insulation:
   1. Acoustical Sealant: Non-shrinking, non-hardening, non-drying, non-skinning, non-bleeding and non-staining type formulated for acoustical use, Pecora BA-98, Tremco Acoustical Sealant, U.S. Gypsum Acoustical Sealant, or approved equal.
      a. For exposed locations to be painted, use skinnable type, Pecora Ac-20, Tremco Acrylic Latex Caulk or approved equal.
   2. Sound Attenuation Blankets: ASTM C665, Type I, semi-rigid mineral or glass fiber blanket without membrane. Provide 1.5" mineral fiber 3.0 lb. Density or full thickness of 1.0 density glass fiber.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates to which drywall construction attaches or abuts, preset hollow metal frames, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of drywall construction. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF METAL SUPPORT SYSTEM

A. General:
   1. Comply with ASTM C754 and C840, and manufacturer’s instructions. Coordinate with mechanical and electrical work. Do not attach or support metal framing to ducts, pipes, conduit.
   2. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated.
   3. Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and at spacing

required to support ceiling.

B. Ceiling Suspension System
   1. Standard Reference: Install in accordance with ASTM C 1002, CIRCA installation standards, and other applicable code references.
   2. Manufacturer's reference: Install in accordance with manufacturer's current printed recommendations.
   3. Drawing reference: Install in accordance with approved shop drawings and locate ceiling in accordance with main tee dimensions relative to elevations.
   4. Component and hanger wire installation:
      a. Flat ceilings:
         1) Main tees shall be spaced a maximum of 48 inched on center and supported by hanger wires spaced a maximum of 48 inches on center and as specified by UL Fire Resistance Directory attaching hanger wires directly to structure above.
         2) Cross tees shall be spaced per manufacturer's recommendations and as specified by UL Fire Resistance Directory.
   5. Install additional tees, cross tees or framing at termination of gypsum board work, and at openings for light fixtures, duct diffuser, access doors and similar openings, as required for support of gypsum boards and other work supported thereon.
   6. Hanger wires are required within 12 inches on both sides of a pivoted spliced clip.
   7. At least one hanger wire is required within 12 inches of a transition clip.
   8. Install accessories as required to meet project requirements.
   9. All gypsum board ceilings to gypsum board walls are not to be taped and are to have a continuous bead of paintable sealant.

C. Partition Framing:
   1. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support free from axial loading. Allow for 1.2 inch vertical movement at top of all partitions. Install each steel framing and furring member so that fastening surfaces do not vary more than 0.125" from plane of faces of adjacent framing.
   2. Install runner tracks at floors, ceiling and structural walls and columns where gypsum wallboard stud system abuts other work.
   3. Extend partition stud system through acoustical ceilings to the structural support or substrate above the ceiling except where otherwise shown.
   4. Space studs 16" o.c., except as otherwise indicated and secure to floor and ceiling runners by use of screws or special crimping tool at each contact surface.
   5. Install steel studs so that flanges point in the same direction and gypsum boards can be installed in the direction opposite to that of the flange.
   6. Frame door openings to comply with details indicated, with GA-219 and with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
      a. Install double 20 gage (0.0329") studs at each jamb for all single doors and 16 gage at double doors.
      b. Extend vertical jamb studs through suspended ceiling and attach to underside of structure above.
   7. All gypsum board wall assemblies on metal stud framing that intersect a gypsum board on CMU wall assembly are not to be taped and are to have a continuous bead of paintable sealant.

D. Furring:
   1. Space wall furring members 24" o.c., except as otherwise indicated.
   2. Nail or screw furring members to structural support where possible; otherwise wire-tie or clip as recommended by manufacturer.
   3. Provide furring, framing to conceal all pipes, ducts, conduits, raceways not indicated as exposed.
   4. All gypsum board wall assemblies on metal stud framing that intersect a gypsum board on CMU wall assembly are not to be taped and are to have a continuous bead of paintable sealant.

3.03 GENERAL GYPSUM BOARD INSTALLATION

A. General:
   1. Pre-Installation Conference: Meet at the project site with the installers of related work and review the coordination and sequencing of work to ensure that everything to be concealed by gypsum wallboard has been accomplished, and that chases, access panels, openings, supplementary framing and blocking and similar provisions have been completed.
   2. Install sound attenuation blankets as indicated, prior to gypsum board unless readily installed after board has been installed.
   3. Verify that thermal insulation specified in other sections has been installed and is complete.
   4. Install metal trim and accessories with screws.
   5. Use screw fasteners for attachment of boards to framing or furring.
   6. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 24" in alternate courses of board.

B. Standards:
   1. In addition to compliance with ASTM C840, comply with manufacturer's instructions and requirements for fire-resistance ratings (if any), whichever is most stringent.

C. Installation:
   1. Install ceiling boards in the direction and manner which will minimize the number of end-butt joints, and which will avoid end joints in the central area of each ceiling. Stagger end joints at least 1'-0". Apply ceilings first to greatest extent possible.
   2. Install wall/partition boards vertically (parallel) without end butt joints and with edge joints over studs and staggered on opposite sides of wall.
   3. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16" open space between boards. Do not force into place.
   4. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
   5. Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flange first.
   6. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.
   7. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors and doors over 32" wide. Apply spot grout at each jamb anchor clip just before inserting board into frame.
   8. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories.
   9. Cover both faces of studs with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are braced internally.
      a. Except where concealed application is required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. Ft. area, and may be limited to not less than 75% of full coverage.
   10. Isolate perimeter of non-load-bearing wallboard partitions at structural abutments. Provide 0.25" to 0.5" space and trim edge with L-type finishing edge trim. Seal joints with acoustical sealant.
   11. Where sound-rated wallboard work is indicated (sound batts), seal the work at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions.
   12. Comply with ASTM C919 and manufacturer's recommendations for location of beads, and close off sound-flanking paths around or through the work, including sealing of partitions above acoustical ceilings.
      a. For double-layer partition systems, work above acoustical ceilings may be installed with base layer only.
   13. Space fasteners in gypsum boards in accordance with ASTM C840 and manufacturer's recommendations, except as otherwise indicated.
   14. All gypsum board wall assemblies on metal stud framing that intersect a gypsum board on CMU wall assembly are not to be taped and are to have a continuous bead of paintable

sealant.

15. All gypsum board ceilings to gypsum board walls are not to be taped and are to have a continuous bead of paintable sealant.

D. Allowable Tolerances:
   1. 1/16" offsets between planes of board faces, and 0.25" in 8'-0" for plumb, level, warp and bow.

E. Control Joints:
   1. Installation: ASTM C840-08 or GA-216-2013 provides the following requirements for installing control joints in gypsum board assemblies:
      a. Section 20.2 (GA 4.7.1.1 & GA 4.7.2) – Control joints shall be installed where indicated on the plans. Full height door frames shall be considered equivalent to a control joint.

   2. Section 20.3 (GA 4.7.3) – Control joints in the gypsum board shall be specified by the architect or designer where any of the conditions described in 20.3.1-20.3.5 exist (GA 4.7.3.1 – 4.7.3.7)

      a. Section 20.3.1 (GA 4.7.3.1) – A control joint shall be installed where a partition, wall, or ceiling traverses a construction joint (expansion, seismic or building control element) in the base building structure.

      b. Section 20.3.2 (GA 4.7.3.2) – Control joints shall be installed where a wall or partition runs in an uninterrupted straight plane exceeding 30 linear feet (9100 mm)

      c. Section 20.3.3 (GA 4.7.3.3) – Control joints in interior ceilings with perimeter relief shall be installed so that linear dimensions between control joints do not exceed 50 ft (15000 mm) and total area between control joints does not exceed 2500 sq ft (230 m²)

      d. Section 20.3.4 (GA 4.7.3.4) – Control joints in interior ceilings without perimeter relief shall be installed so that linear dimensions between control joints do not exceed 30 ft (9100 mm) and total area between control joints does not exceed 900 sq ft (84 m²)

      e. Section 20.3.5 (GA 4.7.3.5) – Control joints in exterior ceilings and soffits shall be installed so that linear dimensions between control joints do not exceed 30 ft (9100 mm) and total area between control joints does not exceed 900 sq ft (84 m²)

   3. Section 20.3.6 (GA 4.7.3.6) – A control joint or intermediate blocking shall be installed where ceiling framing members change direction

   4. Section 20.3.7 (GA 4.7.3.7) – Control joints shall be installed where specified by the architect or designer as a design accent or architectural feature Section 20.4 (GA 4.7.4) – Where a control joint occurs in an acoustical or fire-rated system, blocking shall be provided behind the control joint by using a backing material such as 5/8 in. (15.9 mm) type X gypsum board, mineral fiber, or other tested equivalent. See Figure 2

   5. Non-Rated Assembly:
      Where control joints are installed in non-rated assemblies and are parallel to the framing members, a framing member is required on each side of the opening (Figure 1). This requirement is for the attachment of gypsum board.

3.04 SPECIAL GYPSUM BOARD APPLICATION

A. Gypsum Sheathing:
   1. 2' x 8' Boards: Install “V” shaped groove panels horizontally with grooved edges down, end joints over supports and staggered.
   2. 4' x 8' Boards: Install square edged panels vertically with edges centered on studs and offset from interior gypsum board joints. Use board lengths sufficient to eliminate end joints and provide horizontal stud members where heights exceed available board lengths.
   3. Screw apply as recommended by manufacturer.

3.05 INSTALLATION OF TRIM ACCESSORIES

A. Where feasible, use the same fastener to anchor trim accessory as required for gypsum board. Otherwise, follow manufacturer's instructions.
B. Install metal corner beads at external corners, metal edge trim where edge of gypsum board would be exposed, and metal control joints where indicated.
   1. Install control joints in ceilings exceeding 2500 sq. Ft. in area and in partition, wall, and wall furring runs exceeding 30 ft. and as approved by Architect for visual effect.

3.05 GYPSUM BOARD FINISHING

A. General:
   1. Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration.
   2. Prefill open joints using type of compound recommended by manufacturer. Wipe off excess from "V" groove and allow to harden.
      a. Apply joint tape in taping compound at joints between gypsum boards, except where exposed trim accessory is indicated. Tape in corner beads and termination metal.
      b. Apply taping compound in a thin layer to all joints and angles, place reinforcing tape centered over joint, and follow immediately with thin skim coat to embed tape. Allow to dry thoroughly.
      c. Apply second coat of joint compound over embedding coat, filling panel taper flush with surface. Cover tape and feather out at least 3" beyond joint center, edge of casing bead or nose of corner bead.
      d. Spread third coat (finish coat) evenly over and extend 3" beyond second coat, feathering to a smooth uniform finish.
      e. Where necessary, sand lightly between coats and following the final finish coat to provide a smooth face for decorating. Do not roughen face paper when sanding.
      f. Finish fasteners by filling depression with joint compound and followed by a minimum of two additional coats to leave depression level with surface.
      g. Review and coordinate with finish schedules and 09900 Series sections to assure proper conditions to receive finishes specified.
B. Partial Finishing:
   1. Omit third coat (if specified) and sanding on concealed work which is indicated for wallboard finishing, or which requires finishing to achieve sound or fire rating or to act as an air or smoke barrier.
C. Gypsum Board Finish Levels: Finish panels to levels indicated below:
   1.Level 1: Ceiling plenum areas, concealed areas, and where indicated.
   2.Level 2: Panels that are substrate for tile
   3.Level 4 finish: At panel surfaces that will be exposed to view, unless otherwise indicated (including electrical & mechanical rooms).
      a.Primer and its application to surfaces are specified in other Division 9 Sections.

END OF SECTION 09260

SECTION 09300 - TILE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Conditions of the Contract, General Requirements and other applicable technical specifications apply to work of this Section

1.02 SECTION INCLUDES

A. Ceramic Tile for floor and wall applications.

1.03 REFERENCES

A. ANSI A108 Series/A118 Series/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium).
   1. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar.
   2. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
   3. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex Portland Cement Mortar.
   4. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile Setting Epoxy Adhesive.
   5. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
   6. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework.
   7. ANSI A118.1 - American National Standard Specifications for Dry-Set Portland Cement Mortar.
   8. ANSI A118.4 - American National Standard Specifications for Latex-Portland Cement Mortar.
   9. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation.
   10. ANSI A118.7 - American National Standard Specifications for Polymer Modified Cement Grouts for Tile Installation.
   11. ANSI A118.9 - American National Standard Specifications for Cementitious Backer Units.
   12. ANSI A136.1 - American National Standard for Organic Adhesives for Installation of Ceramic Tile.
   13. ANSI A137.1 - American National Standard Specifications for Ceramic Tile.
B. TCA (HB) - Handbook for Ceramic Tile Installation; Tile Council of America, Inc..

1.04 SUBMITTALS

A. Product Data: Provide instructions for using grouts and adhesives.
B. Samples: Mount tile and apply grout on two plywood panels, 24 x24 inch in size illustrating pattern, color variations, and grout joint size variations.
C. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.05 QUALITY ASSURANCE

A. Maintain one copy of TCA Handbook and ANSI A108 Series/A118 Series on site.
B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in

this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in an unventilated environment.
B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.08 EXTRA MATERIALS

A. Provide 2 percent of each size, color, and surface finish of tile specified, but not less than 10 sf of each type.

PART 2 - PRODUCTS

2.01 TILE MANUFACTURERS

A. Manufacturers
1. Refer to drawings.

B. Wall Tile:
1. As selected by Architect.
2. Size and Shape: Refer to drawings.
3. Edges: Square.
4. Surface Finish: Refer to drawings..
5. Colors: Refer to drawings.
6. Trim Units: Refer to drawings.

C. Floor Tile:
1. Refer to drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

B. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
2. Alkalinity: pH range of 5-9.

3.02 PREPARATION

A. Protect surrounding work from damage.
B. Vacuum clean surfaces and damp clean.
C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.03 INSTALLATION - GENERAL

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and TCA Handbook recommendations.
B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
E. Form internal angles square and external angles square.
F. Sound tile after setting. Replace hollow sounding units.
G. Allow tile to set for a minimum of 48 hours prior to grouting.
H. Grout tile joints. Use standard grout unless otherwise indicated.
I. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
J. **No wall tile are to be smaller than 4". Contractor must coordinate layout with Architect prior to installation if otherwise.**

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCA Handbook Method F116, organic adhesive, with standard grout, unless otherwise indicated.

3.05 INSTALLATION - FLOORS - MORTAR BED METHODS (Where Called For)

A. Over interior concrete substrates, install in accordance with TCA Handbook Method F112, bonded.
B. Mortar Bed Thickness: 5/8 inch, unless otherwise indicated.

3.06 INSTALLATION - WALL TILE

A. Over cementitious on metal studs, install in accordance with TCA Handbook Method W223, organic adhesive.

3.07 CLEANING

A. Clean tile and grout surfaces.

3.08 SEALER

A. Apply sealer in accordance with manufacturer's recommendations.

3.09 PROTECTION OF FINISHED WORK

A. Do not permit traffic over finished floor surface for 4 days after installation.

3.10 SCHEDULE

A. as shown on drawings.

END OF SECTION 09300

SECTION 09305 - TILE ADHESIVES, MORTARS AND GROUTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface Preparation Products: Backerboards, Self-Leveling Underlayments, Waterproofing and Anti-Fracture Membranes, Sound Reduction Mat Underlayments.

B. Setting Materials: Thin-Set Mortars, Specialty Mortars, Ceramic Tile Adhesives.

C. Colored Tile Grouts – Sanded, Non-Sanded and Epoxy Grouts.

D. Tile & Stone Care and Maintenance Products.

1.2 RELATED SECTIONS

A. Division 03 - Concrete substrate.

B. Division 07 - Fluid applied waterproofing.

C. Division 07 - Expansion and control joints.

D. Division 09 - Scratch coat for ceramic wall tile.

E. Division 09 - Gypsum Board System.

F. Division 10 - Toilet accessories.

1.3 REFERENCES

A. ANSI A108.1 - Installation of Ceramic Tile Portland Cement Mortar.

B. ANSI A108.4 - Installation of Ceramic Tile with Organic Adhesives or Water-Cleanable Epoxy Adhesive.

C. ANSI A108.5 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.

D. ANSI A108.6 - Installation of Ceramic Tile with Chemical Resistant, Water-Cleanable, Tile Setting and Grouting Epoxy.

E. ANSI A108.8 - Installation of ceramic tile with chemical-resistant furan resin mortar and grout.

F. ANSI A108.9: - Installation of ceramic tile with modified epoxy emulsion mortar/grout.

G. ANSI A108.10 - Installation of Grout in Tile Work.

H. ANSI A108.11 - Installation of Cementitious Backer Units.

I. ANSI A108.12 – Installation of ceramic tile with EGP (exterior glue plywood) latex-portland cement mortar.

I. ANSI A108.13 - Installation of Waterproof Membranes for Thin-Set Tile and Stone.

J. ANSI A108.14 – Installation of Paper-Faced glass mosaic tile.

K. ANSI A108.15 – Installation of Paper-Faced glass mosaic tile – Alternate Method.

L. ANSI A108.16 – Proposal for installation of paper-faced, back-mounted, edge-mounted, or clear film face-mounted glass mosaic tile.

M. ANSI A118.1 - Dry-Set Portland Cement Mortar.

N. ANSI A118.3 - Chemical Resistant, Water-Cleanable Tile Setting and Grouting Epoxy and Water-Cleanable Tile Setting Epoxy Adhesive.

O. ANSI A118.4 - Latex Portland Cement Mortar.

P. ANSI A118.6 - Ceramic Tile Grouts.

Q. ANSI A118.7 - Polymer Modified Cement Grout.

R. ANSI A118.9: Cementitious Backer Units.

S. ANSI A118.10 - Waterproof membranes for Thin-Set Tile and Stone.

T. ANSI A118.11 – EGP (Exterior Glue Plywood) latex-Portland cement mortar.

U. ANSI A118.12 – Crack Isolation Membranes.

U. ANSI A136.1 - Organic Adhesives, Type I Adhesive and Type II Adhesive.

V. TCA - Handbook for Ceramic Tile Installation.

W. U.S. Product Standard PS 1-83 for Construction and Industrial Plywood.

1.4 SUBMITTALS

A. Submit under provisions of Division 01.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products of this section with minimum ten years documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Locate mock-ups on site in locations and size directed by Architect.
   2. Finish areas designated by Architect.
   3. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   4. Refinish mock-up area as required to produce acceptable work.
   5. Retain and maintain mock-ups during construction in undisturbed condition as a standard for judging completed unit of Work.
   6. Obtain Architect's acceptance of mock-ups before start of final unit of Work.

D. Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements of ANSI A137.1 for labeling sealed tile packages.

B. Prevent damage or contamination to materials by water, freezing, foreign matter and other causes.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Environmental: Install mortar, set and grout tile when surfaces and ambient temperature is minimum 50 degrees F (10 degrees C) and maximum 90 degrees F (32 degrees C). Consult with manufacturer for specific requirements.

C. Do not install mortar, set or grout tile exterior when inclement weather conditions are expected within 48 hours after work is completed unless properly protected.

D. Protection: Protect adjacent work surfaces during tile work. Close rooms or spaces to traffic of all types until mortar and grout has set.

E. Safety: Observe the manufacturer's safety instructions including those pertaining to ventilation.

1.8 WARRANTY

A. Products shall be provided with the manufacturers standard warranty.

1.9 EXTRA MATERIALS

A. Supply an amount equal to 3 percent of each size, color, and surface finish of tile specified.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Custom Building Products, 13001 Seal Beach Blvd., Seal Beach, CA 90740. ASD. Telephone Toll Free: (800) 282-8786. Fax: (800) 200-7765. Web: www.custombuildingproducts.com. Email: jackiel@cbpmail.net.

B. Requests for substitutions will be considered in accordance with provisions of Division 01.

2.2 MATERIALS

A. Anti-Fracture Membrane/Cleavage Membrane: As required for isolating the installation from cracking due to minor substrate movement and normal structural deflections.
1. Custom Building Products RedGard Waterproofing and Crack Prevention Membrane.
2. Custom Building Products Crack Buster Pro Crack Prevention Mat Underlayment.
3. Custom Building Products EasyMat Versatile Underlayment for Setting Tile and Stone with SoundGard Technology. For ASTM C 627 residential and light commercial use only.
4. Custom Building Products Peel & Stick Primer for self adhesive membrane.
5. Custom Building Products Custom 9240 Waterproofing and Anti-Fracture Membrane.

B. Waterproofing and Anti-Fracture Membrane: As required for thin-set tile installations complying with ANSI 118.10 for waterproof membranes.
1. Custom Building Products RedGard Waterproofing and Crack Prevention Membrane.
2. Custom Building Products Custom 9240 Waterproofing and Anti-Fracture Membrane.

C. Uncoupling Mat: For isolating the installation from cracking due to minor substrate movement, normal structural deflections, installing tile over young concrete (14 Day Cure), and single ply floors with a TJI joist system spaced at 19.2” o.c.
1. Custom Building Products SpiderWeb Uncoupling Mat / Mortar System

D. Moisture Barrier System: For thin-set tile installations.
1. RedGard Waterproofing and Crack Prevention Membrane. See moisture barrier installation instructions for RedGard.

E. Self-Leveling Underlayment: To provide a flat, level surface for direct receipt of tile and other floor coverings on dry, interior installations.
1. Custom Building Products LevelQuik Rapid Setting Self-Leveling Underlayment for fills up to 1 inch (25 mm) thick.

2. Custom Building Products LevelQuik Extended Setting Self-Leveling Underlayment for fills up to 1 inch (25 mm) thick.
3. Custom Building Products LevelLite Self-Leveling Underlayment for fills up to 2 inches (51 mm) thick.
4. Custom Building Products LevelQuik Latex Primer for surface preparation.

F. Mortar Bed Installations: For mortar bed or brown coat as the substrate for tile work; work to conform to ANSI A108.1.
1. Custom Building Products CustomFloat Bedding Mortar mixed with 1/2 water and 1/2 Thin-Set Mortar Admix.

G. Cementitious Backer Units: ANSI A118.9 For floors and walls, interior and/or exterior, wet areas, and dry as recommended substrate for tile, fire rated wall installations, heat shield with UL listing for floors and walls; installation to comply with ANSI A108.11 and manufacturer's installation instructions.
1. 1/2 inch (12 mm) WonderBoard Backerboard (Exterior or Interior Floors, Walls, Ceilings, Countertops).
2. 1/4 inch (6 mm) WonderBoard Backerboard (Exterior or Interior Floors and Countertops).

H. Cementitious Tile Adhesives:
1. ANSI A118.1: For setting tile as specified by ANSI A108.5, Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar, over substrates prepared accordingly.
   a. Custom Building Products Wall Tile Thin-Set Mortar.
2. ANSI A118.4: Polymer-Enhanced Mortars:
   a. Custom Building Products Megalite Crack Prevention Mortar. Formulated with a Lightweight Post-Consumer Recycled Aggregate
   b. Custom Building Products MegaLite Rapid Set Crack Prevention Mortar. Formulated with a Lightweight Post-Consumer Recycled Aggregate
   c. Custom Building Products MegaFlex Crack Prevention Mortar.
   d. Custom Building Products ProLite RS Rapid Setting Tile & Stone Mortar. Formulated with a Lightweight Post-Consumer Recycled Aggregate
   e. Custom Building Products ProLite Tile & Stone Mortar. Formulated with a Lightweight Post-Consumer Recycled Aggregate
   f. Custom Building Products VersaBond Flex Fortified Thin-Set Mortar.
   g. Custom Building Products Complete Contact Fortified Thin-Set Mortar.
   h. Custom Building Products Complete Contact RS Fortified Mortar.
   i. Custom Building Products Marble & Granite Fortified Premium Mortar.
   j. Custom Building Products Medium Bed Mortar
3. Latex Additives: A latex additive is to be used as the mixing liquid, per manufacturer's direction, with certain pre-packaged, dry-set mortar mixes, to achieve a Latex Portland Cement Dry Set Mortar complying with ANSI A118.4.
   a. Custom Building Products Thin-Set Mortar Admix formerly Acrylic Mortar Admix; to be mixed with Wall Tile Thin-Set Mortar (exterior installations).

I. Epoxy Tile Adhesives:
1. ANSI A118.3: For setting tile as specified by ANSI A108.6 Chemical Resistant, Water-Cleanable Tile Setting and Grouting Epoxy, over substrates prepared accordingly.
   a. Custom Building Products EBM Lite Epoxy Bonding Mortar –Formulated with a Lightweight Post-Consumer Recycled Aggregate

J. Grout: For filling the joints between tiles to be epoxy.

1. Custom Building Products is an acceptable manufacturer.

K. Silicone Joint Caulk: ANSI A108.01.3.7:
1. Custom Building Products 100% Silicone Caulk - Meeting ASTM C920 for tile assemblies exposed to high foot and equipment traffic.

N. At all tile installation location sealant is to be installed to match the grout color at all vertical corner conditions and adjacent to material change at horizontal locations.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces, which are to receive tile.

B. Do not proceed with work until defects or conditions which would adversely affect quality, execution and permanence of finished tile work are corrected (ANSI A108.3).

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Condition of surface to receive tile.
1. Assure that surfaces to receive tile are stable, flat, firm, dry, clean and free of oil, waxes and curing compounds.
2. Deflection of substrate not to exceed 1/360th of the span 1/2 inch (12 mm) in 15 feet (4.6 m) in accordance with ANSI A108.01-2.3. Allow for live and impact load as well as dead load weight of tile and setting bed.
3. Protect adjacent surfaces prior to beginning tile work.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Surface Preparation for Tile.
1. General:
a. All supporting surfaces shall be structurally sound, solid, stable, level, plumb, and true to a tolerance in plane of 1/4 inch (6 mm) in 10 feet 0 inch (3 m) for walls, 1/4 inch (6 mm) in 10 feet (3 m) for floors when specified for thin-set method. They shall be clean and free of dust, oil, grease paint, tar, wax, curing compound, primer, sealer, form release agent, laitance, loosely bonded topping, loose particles or any deleterious substance and debris which may prevent or reduce adhesion.

b. Mechanically sand and scarify the substrate to completely remove all paint, loosely bonded topping, loose particles and construction debris.
c. Neutralize any trace of strong acid or alkali.
d. All substrates shall be dry. The moisture content shall not exceed 50 percent.
e. Turn off all forced ventilation and radiant heating systems and protect work against drafts during installation and for a period of at least 72 hours after completion. Use indirect auxiliary heaters to maintain the temperatures in the area at the recommended workable level. Vent temporary heater to exterior to prevent damage to tile work from carbon dioxide build-up.
f. Presswood, particleboard, chipboard, masonite, gypsum floor patching compounds, asbestos board, Luan and similar dimensionally unstable materials are not acceptable substrates. Before work commences examine the areas to be covered and report any flaw or adverse condition in writing to the architect and to the general contractor. Do not proceed with work until surfaces and conditions comply with the requirements indicated in ANSI A108 specifications.

2. Concrete:
   a. All concrete substrates shall be at least 28 days old, completely cured and free of hydrostatic conditions, and/or moisture problems.
   b. New concrete surfaces for dry-set mortar, medium-bed mortar or thick-bed mortar installations shall be wood floated or broom finished. Concrete walls should be bush-hammered or heavily sandblasted.
   c. On grade or below grade concrete slabs must be installed over an effective vapor barrier and be exempt from hydrostatic pressures.
   d. Over excessively dry porous concrete, keep the concrete substrate continuously moist for at least 24 hours before work begins when using dry-set mortars or medium-bed mortars. Remove all excess water or standing water allowing the surface to become almost dry before installing the leveling coat, dry-set mortar or medium-bed dry-set mortar.
   e. For minor repairs and smoothing up to 1/2 inch (12 mm), use Skim Coat & Patch Cement Underlayment or SpeedFinish Patching & Finishing Compound.
   f. For leveling of large areas use LevelLite Self-Leveling Underlayment for pours up to 2 inches (51 mm) thick, LevelQuik Rapid Setting Self-Leveling Underlayment for pours up to 1 inch (25 mm) thick or Extended Setting Self-Leveling Underlayment for pours up to 1 inch (25 mm) thick.
   g. CustomFloat Bedding Mortar mixed with water and Acrylic Mortar Admix to build-up or level a concrete substrate requiring a topping between 1/2 inch (12 mm) and 2 inch (50 mm) average thickness (see data sheet for details).

3. Backerboard Units Installation of Floors, Decks or Countertops:
   a. General Framing: All framing should comply with local building code requirements and be rigid with a maximum deflection or movement of 1/360 under all intended live (including wind and rain) and dead loads.
   b. Subfloor Requirements: 5/8 inch (16 mm) exterior grade plywood or OSB panels (PRP-108) should be securely glued or fastened to floor joists. Floor joists should be spaced a maximum of 16 inches (40.6 cm) O.C. 3/4 inch (19 mm) exterior grade plywood or OSB subfloor framed with I-joists spaced a maximum of 19.2 inches O.C. (48.7 cm) is also acceptable. I-joists or truss systems spaced a maximum of 24 inches (61 cm) O.C. with a 3/4 inch (19 mm) exterior grade plywood or OSB subfloor is acceptable when 1/2 inch (12 mm) WonderBoard is used as the backerboard. When setting dimensional stone larger than 12 inches by 12 inches (30 cm by 30 cm) a 3/4 inch (19 mm) subfloor must be used for all installations. All plywood or OSB subfloor sheets must be gapped 1/8 inch (3 mm).

c. Using a 1/4 by 1/4 inch (6 by 6 mm) square-notched trowel, apply a Custom polymer-modified thin-set mortar to the subfloor or base.
d. Immediately place WonderBoard panels onto fresh mortar. Leave a 1/8 inch (3 mm) gap between boards at all joints and corners. Stagger the joints so they do not line up with underlying substrate joints.
e. Fasten panels every 6 to 8 inches (152 to 203 mm) on center throughout the field and within 1/2 inch to 2 inches (12.5 to 51 mm) from the edge using 1-1/4 inch (32 mm) concrete backerboard screws or 1-1/2 inch (38 mm) galvanized roofing nails.
f. Fill all corners and the joints between panels in all installations with polymer-modified thin-set mortar.

4. Wall and Ceiling Installation
   a. Wall and Ceiling: Edges of backerboard parallel to framing should be continuously supported. Studs above a shower floor should be either notched or furred to accommodate the thickness of the waterproof membrane or shower pan. The surround opening for a tub or precast shower receptor should not be more than 1/4 inch (6 mm) longer than unit to be installed. The complete ceiling assembly allowable deflection should not exceed 1/360 of the span. Framing members in ceiling should not exceed 16 inches (40.6 cm) O.C.
   b. Backerboard Installation: Fasten backerboard to studs every 6 to 8 inches (152 to 203 mm) on center throughout the panels and within 1/2 inch (12.5 mm) to 2 inches (51 mm) from panel edges using 1-1/4 inches (32 mm) concrete backerboard screws or 1-1/2 inches (38 mm) galvanized roofing nails. Leave a 1/8 inch (6 mm) gap at all joints and corners. Stagger board joints with those of adjacent rows.
      1) Where open mesh wrapped edges meet, fill the gap completely with thin-set mortar.
      2) On all other joints and corners, prefill the gap with thin-set mortar, then embed 2 inch wide (51 mm) alkali-resistant mesh tape and smooth.
5. Gypsum surfaces:
   a. Gypsum dry wall panels and gypsum plaster walls shall be set with a polymer modified thin-set mortar or mastic.
   b. Gypsum-based floor patching compounds are not acceptable substrates to receive tiles.
6. Steel:
   a. Steel substrates shall be rigid, solidly fixed, dry, well sanded and free of dust, oil, grease, primer and all deleterious substances, which may prevent or diminish the bond.
7. Tiling over old substrates:
   a. Old cement terrazzo, ceramic tile paver, quarry tile, vinyl and vinyl composition floor coverings other than cushion vinyl shall be sound, solidly in place, flawless, stripped or sanded, clean, free of dust, wax, grease, sealers, soap residue and all other deleterious substances which may prevent or reduce the adhesion. For further details, see the TCA Handbook for Ceramic Tile Installation.

C. Install tile in accordance with appropriate ANSI A108 specifications and manufacturer's directions.

D. Expansion joints, control joints, insulation joints, etc., must be located in compliance with TCA EJ171 and filled with appropriate materials.

1. Joints must be carried through all layers of installation materials including tile, setting bed, mortar bed and reinforcing wire. Joints should be every 20 to 25 feet (6.1 to 7.3 m) in both directions for interior installations and 8 to 12 feet (2.4 to 3.6 m) in both directions for exterior installations. (Refer to TCA Handbook, EJ171 and ANSI AN-3.8 for details on placement, size and specifications of materials.) .

E. Install grout in accordance with Grout ANSI A108.10 specifications and manufacturer's directions.

F. Proper curing of grout entails periodically misting the installation with clean, cool water for a period of 72 hours.

G. Seal grout, stone and unglazed tile with a penetrating sealer such as TileLab SurfaceGard Penetrating Sealer 48 - 72 hours after grout application.

H. Seal grout and polished granite with Stone Specific Granite Sealer 48 – 72 hours after installation.

I. Seal grout and polished marble, travertine and limestone with Stone Specific Marble, Travertine and Limestone Sealer 48 - 72 hours after installation.

J. Seal grout and honed/tumbled marble, travertine, limestone and slate with Stone Specific Marble, Travertine, Limestone and Slate Sealer.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 09305

SECTION 09511 – ACOUSTICAL PANEL CEILINGS

2.3 ACOUSTICAL TILES

A. ACT-1

1. Basis of Design: Subject to compliance with project requirements, the design is based on the following: USG Interiors, LLC, “Mars High-NRC/High-CAC with plant based binder”.
2. Classification: Provide ceiling panels complying with ASTM E 1264 for type, form and pattern as follows:
   a. Type: IV, mineral base with membrane faced overlay
   b. Form: 1 & 2, Nodular and water felted
   c. Pattern: E & G, smooth and light texture
3. Color: Flat White 050.
4. LR: Not less than 0.90. (White)
5. NRC: Not less than 0.90.
6. CAC: Not less than 30.
7. Edge/Joint Detail: FLB Flush reveal.
8. Suspension Grid Width: DXF 9/16 inch (14 mm).
9. Panel Thickness: 3/4 inch (19 mm).
10. Modular Size: 24 by 48 second look inches (610 by 610 mm).
11. Recycled Content: 65%
12. High Recycled Content Product: Classified as containing greater than 50% total recycled content. Total recycled content is based on product composition of post-consumer and pre-consumer post-industrial recycled content per FTC guidelines.
13. VOC Emissions: Meets CA Specification 01350, GreenGuard Gold Low VOC
14. ClimaPlus™ 30 year Warranty Performance: Contains a broad spectrum antimicrobial additive on the face and back of the panel that provides resistance against the growth of mold and mildew. Includes sag resistance performance.

END OF SECTION

SECTION 09653 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Resilient Wall Base

1.02 REFERENCED DOCUMENTS

A. ASTM International:
   1. F 1861 Standard Specification for Resilient Wall base
   2. E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
   3. F 386 Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces
   4. E 648 Standard Test Method for Critical Radiant Flux of Flooring systems Using a Radiant Energy Source.
   5. E 662 Test Method for Specific Density of Smoke Generated by Solid Materials.
   6. F 925 Standard Test Method for Resistance to Chemicals of Resilient Flooring.
   7. F 137 Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus
   8. F 1515 Standard Test Method for Measuring Light Stability of Resilient Vinyl Flooring by Color Change

B. Other Referenced Documents
   1. National Fire Protection Association (NFPA): NFPA 255, Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source
   2. National Fire Protection Association (NFPA) 258 Test Method for Specific Density of Smoke Generated by Solid Materials.
   3. California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65).
   4. The Collaborative for High Performance Schools (CHPS)

1.03 SUBMITTALS

A. Product Data: Submit product data, including manufacturer's specification summary sheet for specified products

B. Shop Drawings: Submit shop drawings showing layout, finish colors, patterns and textures
.

C. Samples: Submit selection and verification samples for finishes, colors, and textures.

D. Quality Assurance Submittals: Submit the following:
   1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
   2. Manufacturer's Instructions: Manufacturer's installation and maintenance instructions.

E. Submit the following:
   1. Maintenance Data: Maintenance data for installed products in accordance with Division 1 sections. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
   2. Warranty: Warranty documents specified herein.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installing work similar to that required for this project.

B. Regulatory Requirements
    1. Fire Performance characteristics: Provide resilient sheet vinyl floor covering with the following fire performance characteristics as determined by testing products in accordance with ASTM method (and) NFPA method indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction.
        a. ASTM E 648 (NFPA 253), Critical Radiant Flux of Floor Covering Systems: Class 1, > 1.0 W/cm2
        b. ASTM E 662 (NFPA 258), Specific Optical Density of Smoke Generated by Solid Materials: Passes, <450
        c. ASTM E 84 (NFPA 255), Surface Building Characteristics of Building Materials: Class C

C. Single-Source Responsibility: Obtain resilient wall base and manufacturer’s recommended adhesive from a single supplier.

D. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate Conditions & manufacturer’s recommended substrates and required preparation manufacturer's installation instructions and manufacturer's warranty requirements. Comply with requirements in Division 1.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with requirements in Division 1.

B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and acclimated to site conditions at temperature and humidity conditions recommended by manufacturer.

1.06 PROJECT CONDITIONS

A. Environmental Requirements/Conditions: In accordance with manufacturer's recommendations, areas to receive resilient wall base shall be clean, fully enclosed, weather tight with the permanent HVAC set at a uniform temperature of 65-85 degrees F for 48 hours prior too during, and thereafter installation of resilient wall base. Resilient wall base and adhesive shall be conditioned in the same manner. Resilient wall base must be unboxed & acclimated in area of use at least 48 hours prior to installation. Minimum temperature shall be a 65 degrees F after installation.

1.07 SEQUENCING AND SCHEDULING

A. Finishing Operations: Install resilient wall base after finishing operations, including floor covering painting and ceiling operations etc., have been completed.

1.08 WARRANTY

A. Manufacturer's Materials Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
    1. Warranty Period: 1 year limited warranty commencing on Date of Substantial

Completion. Notice of any defect must be made in writing to manufacturer within thirty (30) days after buyer learns of the defect.

2. Limited Wear Warranty: 3 year limited wear warranty.

1.09 MAINTENANCE

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division One Closeout Submittals Section.
   1. Quantity: Furnish quantity of Resilient Wall Base equal to 5% of amount installed.
   2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

B. Maintenance of finished floor covering to be conducted per Manufacturer’s Maintenance Guide.

PART 2 PRODUCTS

2.01 RESILIENT WALL BASE

A. Manufacturer: Roppe Corporation
   1. Contact: P.O. Box 1158 Fostoria, Ohio USA 44830-1158 Phone: (419) 435-8546 Fax: (419) 435-1056
   2. Approved Equal: Burke

B. Test results:
   1. Thickness tolerance: Complies with ASTM F-386
   2. Flexibility: Complies with ASTM F-137
   3. Resistance to Heat Aging: Complies with ASTM F-1515
   4. Resistance to Detergents: Complies with ASTM F-925
   5. Resistance to Alkalis: No fading or softening
   6. Dimensional Stability: Complies with ASTM F 1861
   7. Squareness: 90 degrees +/- 0.5 degrees
   8. Does do not contain any of the hazardous chemicals listed in California Proposition 65
   9. Collaborative for High Performance Schools (CHPS) 01350 Low-Emitting Material Criteria: Pass

C. Product:
   1. Roppe Pinnacle Rubber Base, color to be selected from from manufacturers full color range.
      a. Complies with ASTM F-1861 Type TS (Thermoset Vulcanized Rubber), Group 1 (Solid)
      b. Contains 10% natural rubber
      c. Thickness: 1/8” (3.175 mm) nominal
      d. Profile
         1.) Standard Toe (Cove base)
            a.) Nominal Height 4"
            b.) Lengths: 120' coils
            c.) Corners
               i. Formed by installer on site

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: See Division 1 for substitution requests.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer’s instructions for installation.

B. Adhesive: Roppe 205 Wall Base Adhesive

C. Caulking: Roppe Colored Caulk

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions are acceptable for installing product in accordance with manufacturer's instructions.

B. Material Inspection: In accordance with manufacturer's installing requirements, visually inspect materials prior to installing. Material with visual defects shall not be installed.

3.03 PREPARATION

A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

B. Surface Preparation, General: Prepare substrate in accordance with manufacturer's instructions.

C. Substrate: Prepare manufacturer’s recommended substrates to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as paint, dust, grease, oils, solvent, old adhesive residue, vinyl wall coverings, non-porous surfaces and all other contaminants that may interfere with adhesive bond.

3.04 INSTALLING

A. Manufacturer’s instructions for specifications on installing resilient wall base.

B. Resilient wall base colors, heights and profiles: As selected by Architect.

C. Roppe Adhesive

D. Roppe Colored Caulk

3.05 FIELD QUALITY REQUIREMENT

A. Manufacturer's Field Services: Upon Owner's request and with minimum 72 hours notice, provide manufacturer's field service consisting of product use recommendations and periodic site visits to confirm installing of product is in accordance with manufacturer's instructions.

3.06 CLEANING

A. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance. Remove construction debris from project site and legally dispose of debris.

END OF SECTION 09653

SECTION 09680 - CARPET

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. This Section includes carpet and installation.

1.03 SUBMITTALS

A. See Section 01300 - Submittals, for submittal procedures.
B. Product Data for each type of carpet material, and installation accessory specified. Submit manufacturer's printed data on physical characteristics, durability, fade resistance, and fire-test-response characteristics. Submit methods of installation for each type of substrate.
C. Shop Drawings showing columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Indicate the following:

1.Carpet type, color, and dye lot.
2. Locations where dye lot changes occur.
3. Seam locations, types, and methods.
4. Type of subfloor.
5. Type of installation.
6. Pattern type, repeat size, location, direction, and starting point.
7. Pile direction.
8. Type, color, and location of insets and borders.

9.Type, color, and location of edge, transition, and other accessory strips.
10. Transition details to other flooring materials.

D. Samples for initial selection in the form of manufacturer's color charts or Samples of materials showing the full range of colors, textures, and patterns available for each type of carpet indicated.

E.Samples for verification of the following products, in manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected. Prepare Samples from the same material to be used for the Work. Label each sample with manufacturer's name, material type, color, pattern, and designation indicated on Drawings and carpet schedule. Submit the following:

1.12-inch- (300-mm-) square Samples of each type of carpet material required.
2. 12-inch (300-mm) Samples of each type of exposed edge stripping and accessory item.

F. Schedule of carpet using same room designations indicated on Drawings.

G.Maintenance data for carpet and cushion to include in the operation and maintenance manual specified in Division 1. Include the following:
1. Methods for maintaining carpet, including manufacturer's recommended frequency for maintaining carpet.
2. Precautions for cleaning materials and methods that could be detrimental to finishes and performance. Include cleaning and stain-removal products and procedures.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who is certified by the Floor Covering Installation Board (FCIB) or who can demonstrate compliance with FCIB certification program requirements.

B.Single-Source Responsibility: Obtain each type of carpet from one source and by a single manufacturer.

C. Carpet Fire-Test-Response Characteristics: Provide carpet with the following fire-test-response characteristics as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify

carpet with appropriate markings of applicable testing and inspecting agency.

1.Surface Flammability: Passes CPSC 16 CFR, Part 1630.

2.Flame Spread: 25 or less per ASTM E 84.

3. Smoke Developed: 450 or less per ASTM E 84.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 5: "Storage and Handling."

B. Deliver materials to Project site in original factory wrappings and containers, labeled with identification of manufacturer, brand name, and lot number.

C. Store materials on-site in original undamaged packages, inside well-ventilated area protected from weather, moisture, soilage, extreme temperatures, and humidity. Lay flat, with continuous blocking off ground.

1.06 PROJECT CONDITIONS

A. Space Enclosure and Environmental Limitations: Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

1.07 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B.Special Carpet Warranty: Submit a written warranty executed by carpet manufacturer and Installer agreeing to repair or replace carpet that does not meet requirements or that fails in materials or workmanship within the specified warranty period. Failures include, but are not limited to, more than 10 percent loss of face fiber including seam integrity, edge raveling, snags, runs, and delamination.

C.Warranty Period: 10 years from date of Final Acceptance.

1.08 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

1.Carpet: Before installation begins, furnish quantity of full-width units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Patcraft

2.02 MATERIALS

A. Carpet

1. Refer to A6.0

B. Adhesive
   1 Adhesive for use in carpeting work shall be non-toxic, non-flammable waterproof release type cement as recommended and warranted by the carpet manufacturer for the intended application.

2.03 INSTALLATION ACCESSORIES

A. Concrete-Slab Primer: Non-staining type as recommended by the following:
B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated and to comply with flammability requirements for installed carpet as recommended by the following:

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine subfloors and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting performance of carpet. Do not proceed with installation until unsatisfactory conditions have been corrected.
B. Verify that subfloors and conditions are satisfactory for carpet installation and comply with requirements specified in this Section and those of the following:
   1. Carpet manufacturer.

3.02 PREPARATION

A. General: Comply with carpet manufacturer's installation recommendations to prepare substrates indicated to receive carpet installation.
B. Level subfloor within 1/4 inch in 10 feet (6 mm in 3 m), noncumulative, in all directions. Sand or grind protrusions, bumps, and ridges. Patch and repair cracks and rough areas. Fill depressions.
   1. Use leveling and patching compounds to fill cracks, holes, and depressions in subfloor as recommended by the following:

C.Remove subfloor coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone.

D. Broom or vacuum clean subfloors to be covered with carpet. Following cleaning, examine subfloors for moisture, alkaline salts, carbonation, or dust.

E.Concrete-Subfloor Preparation: Apply concrete-slab primer, according to manufacturer's directions, where recommended by the following:
   1. Carpet manufacturer.

3.03INSTALLATION

A. Direct Glue-Down Installation: Comply with CRI 104, Section 8: "Direct Glue-Down."
B. Comply with carpet manufacturer's recommendations for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under door in closed position. Do not bridge building expansion joints with continuous carpet.
C. Where demountable partitions or other items are indicated for installation on top of finished carpet floor, install carpet before installation of these items.
D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. **Bind or seal** cut edges and seams recommended by carpet manufacturer.
E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
F. Install pattern parallel to walls and borders.

3.04 CLEANING

A. Perform the following operations immediately after completing installation.
   1. Remove visible adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
   2. Remove protruding yarns from carpet surface.
   3. Vacuum carpet using commercial machine with face-beater element.

3.05 PROTECTION

A. General: Comply with CRI 104, Section 15: "Protection of Indoor Installation."
B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure carpet is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09680

SECTION 09775 - FIBERGLASS REINFORCED PLASTIC PANELS

PART 1: GENERAL

1.01 DESCRIPTION:

A. This section describes the requirements for furnishing and installing fiberglass reinforced plastic panels according to manufacturer's recommendations.

B. Refer to architectural drawings for all locations.

1.02 SUBMITTALS:

A. Submit in accordance with Division 01

1. Two samples of each type of panel, each type of trim and fastener.

2. Shop Drawings: Indicate the location and dimension of joints and fastener attachments.

3. Installation Guide #6211.

1.03 QUALITY ASSURANCE:

A. Provide panels and molding only from the manufacturer specified to ensure warranty and color harmonization of accessories.

B. Provide moldings and trim at all conditions for a complete system (floor, ceilings, corners, panel to panel, ect).

C. Provide full panels. No cut panels will be approved.

1.04 DELIVERY, STORAGE AND HANDLING:

A. Delivery of Materials: Package sheets on skids or pallets for shipment to project site.

B. Storage of Materials: Store panels in a dry place at the project site.

C. Handling: Remove foreign matter from face of panel by use of a soft bristle brush, avoiding abrasive action.

1.05 Project Conditions:

A. Installation shall not begin until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete or terrazzo work has dissipated.

B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.

C. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

PART 2: PRODUCTS

2.01 MATERIALS:

A. Class III (C) Interior Finish. Wall panels shall be Hardstop Protective panels by Formica

1. Wall Panels:

Finish, thickness and color to be from the manufacturers full color range

a. Smooth 0.09" (2.3mm) Glasbord-P with Surfaseal color as selected

b. Moldings: Harmonizing PVC (polyvinyl chloride) moldings shall match wall panel color

B. Alternate products shall meet or exceed the following Hardstop properties:

1. Independent laboratory ASTM-E84 testing.

2. Class C Flame Spread of 200 or less, Smoke Developed of 450 or lower per ASTM E-84 latest version.

3. Barcol Hardness (scratch resistance per ASTM D-2583 of:

a. 42 for embossed 0.09" (2.3mm) Glasbord-P

b. 55 for embossed 0.12" (3.0mm) Glasbord-PWI

c. 55 for smooth 0.075" (1.9mm) Glasbord-PSI

d. 60 for embossed 0.10" (2.5mm) Glasbord-CGI

4. Panels will exhibit no more than a 0.038% weight loss after a 25-cycle Taber Abrasion Test.
5. Gardner Impact Strength of 16 in./lbs. (19 cm/kg) for Glasbord-P and Glasbord-CGI, and 18 in./lbs. (21 cm/kg) for Glasbord PSI per ASTM D-3029
6. Meets USDA/FSIS Requirements.
7. ICBO Report Number 4583.
8. A means of frontside identification and confirmation of meeting Class III (C) interior finish requirements after installation and while in service (without labels) embossed panels only.

C. Division Bars, Corner Trim: Panel manufacturer's standard length extruded vinyl pieces; longest length possible to eliminate end joints.

D. Fasteners: Non-corrosive drive rivets.

PART 3

3.01 PREPARATION

A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean, and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.

B. Do not begin installation until backup surfaces are put into satisfactory condition.

3.02 APPLICATION:

A. Do all cutting with carbide tipped saw blades or drill bits, or cut with snips.

B. Install panels with manufacturer's recommended gap for panel field and corner joints.

C. Fastener holes in the panels must be predrilled 1/8" (3.2mm) oversize.

D. For trowel type and application of adhesive, follow adhesive manufacturer's recommendation.

E. Using products acceptable to manufacturer, install the FRP panel system in accordance with panel manufacturer's printed instructions, Installation Guide #6211.

F. All seams to sealed.

3.03 CLEANING:

A. Remove any adhesive or excessive sealant from panel face using solvent or cleaner recommended by panel manufacturer.

END OF SECTION 09775

SECTION 09900 - PAINTS AND COATINGS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes surface preparation and field application of interior and exterior paints, coatings, stains and varnishes.

1.03 RELATED SECTIONS

A. Division 03 - Bases, Ballasts, Pavements and Appurtenances: Traffic marking paint.
B. Division 05 - Structural Steel: Shop priming.
C. Division 05 - Metal Fabrications: Shop priming.
D. Division 06 - Finish Carpentry: Back priming of trim.
E. Division 09 - High Performance Coatings.
F. Division 15 - Mechanical Identification: Markers and color-coding scheme.
G. Division 16 - Electrical Identification: Markers and color-coding scheme.

1.04 REFERENCES

A. ASTM D 16-Terminology Relating to Paint, Varnish, Lacquer, and Related Products.
B. SSPC-SP-2-Hand Tool Cleaning, 1982.
C. SSPC-SP-3-Power Tool Cleaning, 1982.
D. SSPC-SP-6-Commercial Blast Cleaning, 2000.

1.05 SUBMITTALS

A. Submit under provisions of Division 01.
B. Product Data: Submit both a material list and manufacturer's data sheet for each paint system indicated. Include information for all primers, undercoats and block fillers.
C. Application Instructions: Provide coating manufacturer's printed application instructions for each product, including product storage and surface preparation instructions.
D. Selection Samples: Provide two sets of color chips representing manufacturer's full range of colors.
E. Verification Samples: Provide two samples 6 inches square of actual product, color and sheen for each painting system specified. Samples shall include primers, sealers or blockfillers. Apply each coat stepped, defining each separate coat.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of products specified in this Section for a minimum of 10 years.
B. Applicator Qualifications: Company experienced in applying paints and coatings similar to those specified in this Section with a minimum of 5 years documented experience.
C. Source Limitations: Provide materials from the same manufacturer for each specified paint system.
D. Mock-Ups: Provide benchmark samples for each type of finish system, sheen and substrate indicated.
    1. Architect will select area to represent surfaces for each system specified in Part 3.
        a. Wall and Ceiling Surfaces: Provide samples of at least 100 square feet.
        b. Door and Frame Surfaces: Provide sample assembly.
        c. Other Substrates: Architect will designate items or areas required.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site in manufacturer's original, sealed, and labeled container.
B. Manufacturer's label shall include the following information:
   1. Product name
   2. Product code number
   3. Product lot number
   4. Application instructions
   5. Surface preparation instructions
   6. Cleanup requirements
   7. Color designation
   8. Thinning instructions
C. Store materials until use according to manufacturer's instructions in a well-ventilated area.
D. Store and dispose of solvent-based materials in accordance with requirements of local authorities having jurisdiction over project.

1.08 PROJECT CONDITIONS

A. Apply coatings only when environmental conditions recommended by the manufacturer are met.
B. Do not apply coatings in snow, rain, fog or mist, or when temperatures are less than 5 degrees F above the dew point. Do not apply materials to damp or wet surfaces.
C. During application of coating materials, mark areas with "Wet Paint" signs.

1.09 EXTRA MATERIALS

A. Furnish for each product, color and finish specified 2 gallons of coating material, in sealed 1-gallon containers, clearly marked with color and manufacturer's label.

PART 2 - GENERAL

2.01 MANUFACTURERS

a. Basis-of-Design Product: Subject to compliance with requirements, provide Sherwin-Williams Company (The); products indicated or comparable product from one of the following:

B. Acceptable Paint Manufacturers:
   a. Benjamin Moore Corporation
   b. Diamond Vogel
   c. PPG Architectural Finishes
   d. Tnemec Company, Inc.
   e. Sherwin-Williams

3. For epoxy and high performance coatings, provide:
   f. Benjamin Moore
   g. Diamond Vogel
   h. PPG
   h. Sherwin-Williams
   i. Tnemec

2.02 MATERIALS

A. Paints and Coatings - General:
   1. Provide factory mixed coatings, except for field-catalyzed coatings. When required, mix coatings according to manufacturer's instructions prior to application. Do not dilute or thin coatings, except as recommended by manufacturer.
   2. Do not add additives, except as instructed by manufacturer.
   3. For opaque finishes, tint each coat, including primer coat one half lighter shade than succeeding coat, with final finish coat being the specified shade.

4. Colors: To be selected from manufacturer's full range of architectural colors.

B. Accessory Materials: Provide materials necessary to achieve finishes specified including but not limited to thinners, cleaning agents and sanding aides as recommended by coating manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and substrates are free of surface imperfections and containments that could inhibit performance or appearance of coatings. Report immediately any condition that may affect coating application, performance or appearance prior to starting any work.
B. Ensure substrates' moisture content is within tolerances recommended by coating manufacturer prior to application of coatings.
C. Test shop applied primers for compatibility with subsequent primers or finish systems.
D. Ensure concrete and masonry surfaces' pH level is within tolerances recommended by coating manufacturer prior to application of coatings.

3.02 PREPARATION

A. Do not apply coatings until substrates are free of conditions that will inhibit proper coating adhesion or appearance.
B. Immediately prior to application of coating, remove all dust, dirt, and other foreign matter from substrate.
C. Stains and Marks: Remove completely if possible with products recommended by the coating manufacturer. If removal is not possible, spot-prime areas with a stain-blocking primer recommended by coating manufacturer.
D. Exterior Cement Board: Remove dirt, dust, efflorescence, wax, oil, grease, chalk and other contaminates that would interfere with coating adhesion or appearance. Surface must be clean, sound, and dry. Patch nail holes, cracks and imperfections with exterior spackling compound recommended by coating manufacturer. Sand and wipe clean.
E. Exterior Concrete Masonry Units: Remove all dirt, dust, efflorescence, wax, oil, grease, chalk and any other contamination that may interfere with coating adhesion. Level all surface projections and mortar spatters by stoning. Rake mortar joints clean and remove all soluble salts. New concrete must cure for a minimum of 30 days at 72 degrees F prior to coating application.
F. Exterior Ferrous Metal: Abrasive blast new steel to SSPC-SP-6. Use proper abrasive to achieve an average of 1.5 - 2.0-mil blast profile. Blasted surfaces must be primed before flash rusting occurs. If blasting is impractical, remove loose rust and mill scale with hand or power abrading tools as per SSPC-SP-2 and SSPC-SP-3.
G. Exterior Galvanized Metal: Remove surface contamination and passivators by scrubbing with cleaning and etching solution recommended by coating manufacturer.
H. Exterior Poured Concrete: Remove all dirt, dust, efflorescence, wax, oil, grease, chalk and any other contamination that may interfere with coating adhesion. Level all surface projections and mortar spatters by stoning. New concrete must cure for a minimum of 30 days at 72 degrees F prior to coating application.
I. Exterior Wood: Remove dirt, dust, efflorescence, wax, oil, grease, chalk and other contaminates that would interfere with coating adhesion or appearance. Surface must be clean, sound, and dry. Patch nail holes, cracks and imperfections with exterior spackling compound recommended by coating manufacturer. Sand and wipe clean. Remove deteriorated wood fibers by scraping, sanding or other abrading methods.
J. Interior Concrete Masonry Units: Remove all dirt, dust, efflorescence, wax, oil, grease, chalk and any other contamination that may interfere with coating adhesion. Level all surface projections and mortar spatters by stoning. Rake mortar joints clean and remove all soluble salts. New concrete must cure for a minimum of 30 days at 72 degrees F prior to coating application.

K. Interior Ferrous Metal: Abrasive blast new steel to SSPC-SP-6. Use proper abrasive to achieve an average of 1.5 - 2.0-mil blast profile. Blasted surfaces must be primed before flash rusting occurs. If blasting is not possible, remove loose rust and mill scale with hand or power abrading tools as per SSPC-SP-2 and SSPC-SP-3.
L . Interior Galvanized Metal: Remove surface contamination and passivators by scrubbing with cleaning and etching solution recommended by coating manufacturer
M. Interior Gypsum Board: Fill imperfections with spackling compound and allow to dry. Spot-prime imperfections after repair with primer recommended by coating manufacturer.
N. Interior Wood and Wood Trim - Opaque: Remove all surface contamination that would interfere with coating adhesion or appearance. Sand smooth any exposed wood surfaces. Patch nail holes and imperfections with wood filler or putty and sand smooth. Remove sanding dust.
O. Interior Wood and Wood Trim - Stain: Remove all surface contamination that would interfere with coating adhesion or appearance. Sand smooth any exposed wood surfaces. Patch nail holes and imperfections with wood filler or putty and sand smooth. Remove sanding dust.

3.03 APPLICATION

A. Apply each coat to uniform coating thickness recommended by coating manufacturer.
B. Apply materials to provide total color and sheen uniformity on all surfaces, regardless of number coats that might be required.
C. Allow each coat to dry thoroughly before application of next coat. Ensure proper coating adhesion of each coat prior to application of next coat.
D. Remove dust, debris and other foreign materials from substrate prior to applying each coat.
E. Produce finish free from shadows, roller shading, roller tailing, sags or hat banding.
F. Contractor will be responsible for damage due to application of coatings to surfaces not scheduled for painting.

3.04 CLEANING

A. Remove spills, spatters, and paint from all surfaces not scheduled for painting.
B. Collect material that may create a fire hazard and store in metal bucket. Remove from premises on a daily basis.

3.05 SCHEDULE - PAINT SYSTEMS

A. Exterior Cement Board: Provide two coats of finish over an intermediate coat and a coat of primer.
   a. Primer: S-W Loxon Concrete & Masonry Primer Sealer, LX02W50, at 3.2 mils dry.
   b. Intermediate: S-W Duration Ext. Acrylic Satin, K33-200 Series, at 2.2-2-6 mils dry, per coat.
   c. Finish: S-W Duration Ext. Acrylic Satin, K33-200 Series, at 2.2-2.6 mils dry, per coat.

B. Exterior Ferrous Metal: Provide two coats of finish over an intermediate coat and a coat of primer.
   a. Primer: S-W Pro-Cryl Universal Primer, B66-310 Series, at 1.9-3.8 mils dry.
   b. Intermediate: S-W Hi-Solids Polyurethane 250, B65 Series, at 3.0-5.0 mils dry per coat.
   c. Finish: S-W Hi-Solids Polyurethane 250, B65 Series, at 3.0-5.0 mils dry per coat.
C. Exterior Galvanized Metal: Provide two coats of finish over an intermediate coat and a coat of primer.
   a. Primer: S-W Pro-Cryl Universal Primer, B66-310 Series, at 1.9-3.8 mils dry.
   b. Intermediate: S-W Hi-Solids Polyurethane 250, B65 Series, at 3.0-5.0 mils dry per coat.
   c. Finish: S-W Hi-Solids Polyurethane 250, B65 Series, at 3.0-5.0 mils dry per coat.

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D. Interior Ferrous Metal: Provide two coats of finish over an intermediate coat and a coat of primer.
   a. Primer: S-W Pro-Cryl Universal Primer, B66-310 Series, at 1.9-3.8 mils dry.

b. Intermediate: S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, at 1.4 mils dry, per coat.
c. Finish: S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, at 1.4 mils dry, per coat.

E. Interior Galvanized Metal: Provide two coats of finish over an intermediate coat and a coat of primer.
a. Primer: S-W Pro-Cryl Universal Primer, B66-310 Series, at 1.9-3.8 mils dry.
b. Intermediate: S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, at 1.4 mils dry, per coat.
c. Finish: S-W Pro Industrial Waterbased Alkyd Urethane Semi-Gloss, B53-1150 Series, at 1.4 mils dry, per coat.

F. Interior Gypsum Board: Provide two coats of finish over an intermediate coat and a coat of primer.
a. Primer: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.0 mils dry.
b. Intermediate: S-W ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1900 Series, at 1.6 mils dry, per coat.
c. Finish: S-W ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1900 Series, at 1.6 mils dry, per coat.

G. Interior Wood and Wood Trim - Opaque: Provide two coats of finish over an intermediate coat and a coat of primer.
a. Primer: S-W Premium Wall & Wood Primer, B28W8111, at 4.0 mils wet, 1.8 mils dry.
b. Intermediate: S-W ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1900 Series, at 1.6 mils dry, per coat.
c. Finish: S-W ProMar 200 HP Zero VOC Latex Semi-Gloss, B31-1900 Series, at 1.6 mils dry, per coat.

H. Interior Wood and Wood Trim - Stain: Provide two coats of finish over a sealer and stain.
a. Stain: S-W Minwax Performance Series Tintable Wood Stain 250 VOC.
b. Sealer: S-W Minwax Waterbased Oil-Modified Polyurethane, Satin
c. Finish: S-W Minwax Waterbased Oil-Modified Polyurethane, Satin.

J. Interior Gypsum Board: Provide two coats of finish over a coat of primer. (Vehicle Bays and Wet Areas)
a. Primer: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600, at 1.0 mils dry, per coat.
b. Intermediate: S-W Pro Industrial Waterbased Catalyzed Epoxy Gloss, B73-300 Series, at 2.0 to 4.0 mils dry, per coat.
c. Finish: S-W Pro Industrial Waterbased Catalyzed Epoxy Gloss, B73-300 Series, at 2.0 to 4.0 mils dry, per coat.

END OF SECTION 09900

SECTION 10430 - SIGNS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 specification sections apply to this section.

1.02 SECTION INCLUDES

A. Room and door signs.

B. Building identification signs.

1.03 REFERENCES

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2003.

B. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; 2004.

1.04 SUBMITTALS

A. See Section 01300 - Submittals for procedures.

B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.

C. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.

D. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

E. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. ADA Requirements: Provide interior signage in compliance with “Title III of the Americans with Disabilities Act (ADA)” for handicapped accessibility requirements. Building signage identifying permanent rooms and spaces, provide with “Grade 2 Braille” and letters raised minimum of 1/32 inch.
   1. Fabricate signs to meet ADA Accessibility Guidelines (ADAAG) and the Uniform Federal Accessibility Standards (UFAS) as required.

C. Single Source Responsibility: For each separate sign tyipe required, obtain signs from one source of a single manufacturer.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.07 ENVIRONMENTAL REQUIREMENTS

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

B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers:
   1. Subject to compliance with requirements.

2.02 SIGNAGE TYPES

A. Accessibility Compliance: All signs are required to comply with ADAAG and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. All Signage Types: Unless otherwise indicated:

   1. Character Font: Helvetica Medium or other sans serif font as indicated.
   2. Character Case: Upper case only.
   3. Background Color: Clear.
   4. Character Color: Contrasting color.

C. Room and Door Signs: As indicated.

   1. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
   2. Use engraved panel signs as specified.
   3. Character Height: 5/8 inch.
   4. Sign size: 8 inches, unless otherwise indicated.
   5. Service Rooms: Identify with room names.
   6. Rest Rooms: Identify with pictograms, the name "UNISEX" and braille.
   7. All signs placed on glass are to have a backpanel.

D. Building Identification Signs:

   1. Use individual metal letters.
   2. Mount on outside wall in location as scheduled and as shown on drawings.

2.03 TACTILE SIGNAGE MATERIALS

A. Engraved Panel Signs: Tactile photopolymer:

   1. Total Thickness: 1/8 inch plex with 1/32" raised lettering per ADA regulations.
   2. Panel Edges: Square.
   3. Panel Corners: Square.
   4. Mounting: Tape adhesive with silicone.

PART 3 EXECUTION

3.01 SIGN SCHEDULE

A. Dimensional Characters
   1. Location: Address signage at exterior wall at locations shown on drawings.
      a. Type: Height as indicated, aluminum numbers; Gillsans.
      b Copy: 365.
   2. Location: Monument sign; See drawings.
   3. Vinyl Letters: Refer to drawing A4.0.
      a. Copy: BENNETT COMMUNITY SAFETY

B. Panel Signs:
   1. Location: Adjacent to door 104
      a. Panel sign: 6 inches square
      b. Copy: Toilet and M & W & HC sysmbols.
   2. Location: Adjacent to door 100B.
      a. Panel sign: 9 inches square.
      b. Copy: “PRESS DOOR BELL FOR ASSISTANCE”
   3. Location: Emergency phone at vestibule.
      a. Panel sign: 9 inches square.
      b. Copy: “EMERGENCY PHONE DIALS 911 ONLY”
   4. Location: Mechanical Room
      a. Panel sign: Minimum 1" letters.
      b. Copy: “WATER SERVICE ROOM”
   6. Location: Fire Alarm Way Finding Map
      a. Panel sign: Fire alarm subcontractor to provide artwork upon approval from Authority Having Jurisdiction.
   7. Location: Exterior at Front Door
      a. Panel Sign: Minimum 1" letters
      b. Copy: “No smoking within 25 ft of building”

   8. Exit signs to be provided at all exterior doors

3.02 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Locate signs where indicated:

   1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
   2. If no location is indicated obtain Owner's instructions.

D. Protect from damage until Substantial Completion; repair or replace damage items.

END OF SECTION 10430

SECTION 10505 - METAL LOCKERS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Knocked-down, quiet metal lockers.

B. See Division 6 Section "Rough Carpentry" for concealed wood support base, furring, blocking, and shims required for installing metal lockers and concealed within other construction before metal locker installation.

1.02 SUBMITTALS

A. Product Data: For each type of product indicated.

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

1. Show base, sloping tops, filler panels, recess trim and other accessories.
2. Include locker identification system.

C. Samples: For each exposed finish.

D. Maintenance data.

1.03 QUALITY ASSURANCE

A. Accessibility Requirements:

1. Provide not less than 1 shelf located no higher than 46 inches (1219 mm) above the floor for side reach.
2. Provide 1 shelf located at bottom of locker no lower than 15 inches (381 mm) above the floor for side reach.
3. Provide hardware that does not require tight grasping, pinching, or twisting of the wrist, and that operates with a force of not more than 5 lbf (22.2 N).

1.04 COORDINATION

A. Coordinate size and location of wood bases for metal lockers.

1.05 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
1. Failures include, but are not limited to, the following:

a. Structural failures.
b. Faulty operation of latches and other door hardware.

2. Damage from deliberate destruction and vandalism is excluded.
3. Warranty Period for Knocked-Down Metal Lockers: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Basis-of-Design Product: The design for each metal locker specified is based on the product named. Subject to compliance with requirements, provide either the named product or an approved comparable product.
2. Manufacturer: Republic, Hadrian Quiet Emperor or approved equal.

2.02 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008, Commercial Steel (CS) Type B, suitable for exposed applications.

B. Expanded Metal: ASTM F 1267, Type II (flattened), Class I, 3/4-inch (19-mm) steel mesh, with at least 70 percent open area.

C. Fasteners: Zinc- or nickel-plated steel, slotless-type exposed bolt heads, and self-locking nuts or lock washers for nuts on moving parts.

D. Anchors: Select material, type, size, and finish required for secure anchorage to each substrate.

2.03 KNOCKED-DOWN, QUIET METAL LOCKERS

A. Basis-of-Design Product: Republic Storage Systems Company, Single and Double Tier Quiet Lockers or a comparable product of one of the following:

B. Available Products:
1. Lyon Workspace Products; Double Tier Quiet Lockers. Coordinate size per drawings.

C. Locker Arrangement: Double tier.

D. Body and Shelves: Assembled by riveting or bolting body components together. Fabricate from 0.0209-inch- (0.55-mm-) thick, unperforated, cold-rolled steel sheet.

E. Frames: Channel formed; fabricated from 0.0528-inch- (1.35-mm-) thick, cold-rolled steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into vertical main frames. Form continuous, integral door strike full height on vertical main frames.

F. Doors: One-piece; fabricated from 0.0528-inch- (1.35-mm-) thick, cold-rolled steel sheet; formed into channel shape with double bend at vertical edges, and with right-angle single bend

at horizontal edges.

1. Doors less than 12 inches (305 mm) wide may be fabricated from 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet.
2. Box lockers less than 15 inches (381 mm) wide may be fabricated from 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet.
3. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
4. Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet; welded to inner face of doors.
5. Sound-Dampening Panels: Manufacturer's standard, designed to stiffen doors and reduce sound levels when doors are closed, of die-formed metal with full perimeter flange and sound-dampening material; welded to inner face of doors.
6. Door Style: Louvered vents at top and bottom of face of door.

G. Hinges: Self-closing; welded to door and attached to door frame with not less than 2 factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.

1. Knuckle Hinges: Steel, full loop, 5 or 7 knuckles, tight pin; minimum 2 inches (51 mm) high. Provide not less than 3 hinges for each door more than 42 inches (1067 mm) high.

H. Projecting Door Handle and Latch: Manufacturer's standard, finger-lift latch control designed for use with either built-in combination locks or padlocks; positive automatic, prelocking, pry resistant; chromium-plated, vandal-resistant, lift-up handle.

1. Latch Hooks: Equip doors less than 48 inches (1219 mm) high with 2 latch hooks; fabricated from minimum 0.0966-inch- (2.5-mm-) thick steel; welded or riveted to full-height door strikes; with resilient silencer on each latch hook.
2. Latching Mechanism: Manufacturer's standard rattle-free latching mechanism and moving components isolated to prevent metal-to-metal contact, and incorporating a prelocking device that allows locker door to be locked while door is open and then closed without unlocking or damaging lock or latching mechanism.

I. Door Handle and Latch for Box Lockers: Stainless-steel strike plate with integral pull; with steel padlock loop that projects through metal locker door.

J. Equipment: Equip each metal locker with identification plate and the following, unless otherwise indicated:
1. Double and Single Tier Units: One double-prong ceiling hook and two single-prong wall hooks.

K. Accessories:

1. Continuous Base: 4 inches (102 mm) high; fabricated from cold-rolled steel sheet, manufacturer's standard thickness, but not less than 0.0528 inch (1.35 mm) thick.
2. Continuous Sloping Tops: Fabricated from cold-rolled steel sheet, manufacturer's standard thickness, but not less than 0.0329 inch (0.85 mm) thick.
3. Recess Trim: Fabricated from 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet.
4. Filler Panels: Fabricated from cold-rolled steel sheet, manufacturer's standard thickness, but not less than 0.0329 inch (0.85 mm) thick.

L. Finish: Baked enamel or powder coat.

1. Color(s): As selected from manufacturer’s full range.

2.04 FABRICATION

A. General: Fabricate metal lockers square, rigid, and without warp; with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch.

1. Form body panels, doors, shelves, and accessories from one-piece steel sheet, unless otherwise indicated.
2. Provide fasteners, filler plates, supports, clips, and closures as required for a complete installation.

B. Unit Principle: Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments.

C. Knocked-Down Construction: Fabricate metal lockers for nominal assembly at Project site using nuts, bolts, screws, or rivets. Factory weld frame members together to form a rigid, one-piece assembly.

D. Hooks: Manufacturer's standard ball-pointed type, aluminum or steel; zinc plated.

E. Identification Plates: Manufacturer's standard etched, embossed, or stamped aluminum plates; with numbers and letters at least 3/8 inch (9 mm) high.

F. Continuous Base: Formed into channel or Z profile for stiffness, and fabricated in lengths as long as practicable to enclose base and base ends of metal lockers; finished to match lockers.

G. Continuous Sloping Tops: Fabricated in lengths as long as practicable, without visible fasteners at splice locations; finished to match lockers. Sloped top corner fillers, mitered.

H. Recess Trim: Fabricated with minimum 2-1/2-inch (64-mm) face width and in lengths as long as practicable; finished to match lockers.

I. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip joint filler angle formed to receive filler panel.

2.05 STEEL SHEET FINISHES

A. Powder-Coat Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard baked-polymer thermosetting powder finish. Comply with resin manufacturer's written instructions for application, baking, and minimum dry film thickness.

2.06 LEED REQUIREMENTS

A. Recycled Content: Provide indication that materials/products contain the maximum amount of re-cycled content permitted in order for materials or products to retain its integrity.
B. Local/Regional Materials: Preference shall be given to products and materials which have been manufactured, harvested, extracted mined quarried, etc. within a 500 mile radius of the project site.
C. Low Emitting Materials: Provide indication that the materials/products contain the maximum amount of VOC content allowed.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install level, plumb, and true; shim as required, using concealed shims.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion, using concealed fasteners.
2. Anchor single rows of metal lockers to walls near top and bottom of lockers.

B. Knocked-Down Metal Lockers: Assemble knocked-down metal lockers with standard fasteners, with no exposed fasteners on door faces or face frames.

C. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

1. Attach hooks with at least two fasteners.
2. Attach door locks on doors using security-type fasteners.
3. Identification Plates: Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
4. Attach recess trim to recessed metal lockers with concealed clips.
5. Attach filler panels with concealed fasteners.
6. Attach sloping top units to metal lockers, with closures at exposed ends.

D. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

END OF SECTION 10505

SECTION 10523 - FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Related documents, drawings and general provisions of contract, including General and Supplementary Conditions and Division 1 specification sections apply to this section.
B. Related sections include the following

1.02 SECTION INCLUDES

A. Portable fire extinguishers
B. Fire extinguishers.
C. Fire protection cabinets

1.03 REFERENCES

A. NFPA 10 - Standard for Portable Fire Extinguishers; National Fire Protection Association.
B. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc..

1.04 PERFORMANCE REQUIREMENTS

A. Conform to NFPA 10.
B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

1.05 SUBMITTALS

A. See Division 01 - General Requirements, for submittal procedures.
B. Shop Drawings: Indicate cabinet physical dimensions.
C. Product Data: Provide extinguisher operational features.
D. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers:
   1. Larsens' Manufacturing Co. Model Architectural Series.
   2. Badger-Powhatan
   3. American Specialties, Inc.
   4. J.L. Industries
   5. Substitutions: Or approved equal.

2.02 FIRE EXTINGUISHERS

A. Dry Chemical Type: Cast steel tank, with pressure gage

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install cabinets plumb and level in wall openings, per current code mounting height.
C. Install surface mounted extinguisher in location indicated on drawings.
D. Secure rigidly in place.
E. Place extinguishers and accessories in cabinets.

3.03 SCHEDULES

A. Locations: As shown on drawings and A 40-B rated fire extinguisher shall be provided at the pull station for the fire extinguishing system. A 4-A 40-BC rating fire extinguisher shall be provided at door 129. 4-A rated, 10-lb. ABC dry chemical fire extinguishers mounted at 3 feet to the bottom of the cabinet.

    1. FE1: Surface mounted extinguishers
    2. FE2: Fire extinguisher cabinets are to be semi recessed, vertical duo panel with frame door style, stainless steel finish, door glazing to be tempered clear float glass, continuous hinge door swing and friction latch, vertical cabinet applied “FIRE EXTINGUISHER” silk screened red lettering.

END OF SECTION 10523

SECTION 10800 - TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A.Toilet and bath accessories, provided by Contractor as shown on the drawings and schedules.
B. Install under Section 06100 as specified in this Section.

1.03 SUBMITTALS

A. Product Data:
   1. Submit manufacturer's technical data and installation instructions for each accessory.
B. Samples:
   1. When requested, submit full-size samples of units to Architect for review of design and operation. Acceptable samples will be returned and may be used in the work. Compliance with all other requirements is the exclusive responsibility of the Contractor.

1.04 QUALITY ASSURANCE

A. Standards:
   1. Conform to requirements of ASTM F46 for grab bars and accessories for test methods, anchorage and functional performance.
B. Products:
   1. Provide products of the same manufacturer for each type of accessory unit and for units exposed in the same areas, unless otherwise acceptable to the Architect.
   2. Stamped names or labels on exposed faces on units will not be permitted, except where otherwise indicated.
   3. Provide locks where indicated, with the same keying for each type of accessory units in the project wherever possible. Furnish two keys for each lock.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Bobrick Washroom Equipment, Inc.
B. Bradley

2.01 MATERIALS

A. Stainless Steel:
   1. AISI Type 302/304, with polished No. finish, 22 gage minimum, unless otherwise indicated.
B. Sheet Steel:
   1. Cold-rolled, commercial quality ASTM A366, 20 gage minimum, unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.
C. Mirror Glass:
   1. FS DD-G-451, Type I, Class I, Quality q2, 0.25" thick, with silver coating, copper protective coating, and non-metallic paint coating complying with FS DD-M-411 of stainless steel frame.
D. Galvanized Steel Mounting Devices:
   1. ASTM A386, hot-dip galvanized after fabrication.
E. Fasteners:
   1. Screws, bolts, and other devices of same material as accessory unit or of galvanized steel where concealed.

2.02 TOILET AND BATH ACCESSORIES

A. Provide toilet and bath accessories, location and itemized in schedule and/or shown on drawings.

B. Toilet accessories, Bobrick Model Numbers, furnished and installed under the General Construction Contract, as follows:

1. Grab Bars: Bobrick, B-6806 18" and 36" and 42", 1.5" diameter, all satin finish, concealed mounting. Provide 256 series anchor plate for stud walls at each toilet room. Provide fasteners per toilet partition manufacturers recommendations where applicable.
2. Towel Bar: Bobrick, B-6737 x 24 -24" (610mm), Satin at shower
3. Soap Dispenser: B-2112 Wall mounted at all sinks.
4. Paper Towel Dispenser: B43944; recessed C Fold
5. Double Robe Hook: Bobrick, B-76727 surface mounting at all shower bench.
6. Toilet Tissue Dispenser: Bobrick, B-6977; Recessed dual roll at all toilet rooms.
7. Mirrors: frameless with polished edges. See drawings for size.
8. Shower Doors: Arizona Shower Door; Tucson Series, Frameless; Continuous hinge heavy glass (3/8" minimum with 12" fixed panel with **no head trim at shower door**, Pull handle, Stainless Steel Hardware, Brushed Nickle Finish. Provide all required and recommended additional items for installation and coordinate door size with architectural plans. Provide wood blocking per manufacturers requirements. Fixed panel & hinge to be opposite side of shower head. Provide clear vinyl strike jamb. Door stop to be provided to prevent shower door from hitting wall or a clear grommet is to be provided to prevent the shower door from hitting shelving or towel bar.

C. Include anchorage devices, trim, accessories as required, for complete installation

D. Coordinate locations of all toilet room accessories with stud spacing & ADA/ANSI standards.

PART 3 - EXECUTION

3.01 INSTALLATION

A.. Use concealed fastenings wherever possible.
B. Provide anchors, bolts and other anchorages, and attach accessories securely to walls and partitions in locations as shown or directed.
C. Install concealed mounting devices and fasteners fabricated of the same material as the accessories, or of galvanized steel, as recommended by manufacturer.
D. Install exposed mounting devices and fasteners finished to match the accessories.
E. Provide theft-resistant fasteners for all accessory mountings. Secure accessories in accordance with the manufacturer's instructions for each item and each type of substrate construction.
F. Unless otherwise indicated, align units with fixtures, other elements and as directed by Architect. Conform to ANSI A117.1 for positions, mounting heights, for access to the handicapped. Coordinate locations with other work to avoid interference and to assure proper operation and servicing of units.

3.02 CLEANING AND ADJUSTMENTS

A. Clean and polish all exposed surfaces after installation and after removing labels and protective coatings or coverings.
B. Test and adjust accessories for proper operation to assure that mechanisms function smoothly. Replace damaged or defective devices.

END OF SECTION 10800

SECTION 11450 - RESIDENTIAL EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1-Specification sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. Kitchen appliances.

1.03 REFERENCES

A. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc..

1.04 SUBMITTALS

A. See Section 01300 - Submittals, for submittal procedures.
B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.

1.06 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators. Dishwasher 10 year warranty for inner wash basket and outer tub and five year limited warranty for in -home service on balance suspension system and drive transmission.

PART 2 - PRODUCTS

2.01 KITCHEN APPLIANCES

A. Under Counter Refrigerator:	U-Line, 24 inch beverage center Model # UHBV024SS01A
B Range/Oven:	Kitchenaid 30" 5 element electric convection. Model # KFEG500ESS
C. Microwave Oven with range hood:	Kitchenaid 1.9 cu ft over the range microwave hood combination. Model # KMHC319ESS
D. Range Hood:	Included with microwave and to exhaust through roof.

E. Dishwasher: Kitchenaid, under counter quiet type, Stainless steel front door and access pane.
Model #KUDC20CVSS

F. Clothes Washer: Whirlpool, front loading, white.
Model #WFW9470WW.

G. Clothes Dryer: Whirlpool, electric, white.
Model #WED9470WW.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify utility rough-ins are present and correctly located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.03 ADJUSTING

A. Adjust operating equipment to efficient operation.

3.04 CLEANING

A. Remove packing materials from equipment.
B. Wash and clean equipment.

END OF SECTION 11450

SECTION 12413 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manual chain operated, shade system.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate location and requirements for blocking with work specified in Sections 061000 Rough Carpentry, 061053 Miscellaneous Rough Carpentry, and 092216 Non-Structural Metal Framing.
2. Coordinate installation and clearance requirements with glass installation work specified in Division 8 Specification Sections and finish installation work specified in Division 9 Specification Sections applicable to this Section.

B. Preinstallation Meetings:

1. Preliminary Meeting: Before starting framing installation, conduct a conference at Project Site.

a. Meet with Owner, Architect, framing installer, gypsum board installer, glazing installer, and other installers whose work interface with or affects interior window treatment.
b. Review methods and procedures related to interior window treatment, including roller shade fabricator's written instructions.
c. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
d. Review blocking, framing, and clearance requirements for roller shade installation.

1.3 DEFINITIONS

A. Inside Shade Band: The shade closest to the glass pane in dual roll shade systems.

B. Outside Shade Band: The shade furthest from the glass pane in dual roll shade systems.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.

B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.

C. Samples: For each exposed product and for each color and texture specified, 10 inches (250 mm) long.

D. Samples for Initial Selection: For each type and color of shadeband material.

1. Include Samples of accessories involving color selection.

E. Samples for Verification: For each type of roller shade.

1. Shadeband Material: Not less than 10 inches (250 mm) square. Mark inside face of material if applicable.
2. Roller Shade: Full-size operating unit, not less than 16 inches (400 mm) wide by 36 inches (900 mm) long for each type of roller shade indicated.
3. Installation Accessories: Full-size unit, not less than 10 inches (250 mm) long.

F. Roller-Shade Schedule: Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of shadeband material, signed by product manufacturer.

C. Product Test Reports: For each type of shadeband material, for tests performed by a qualified testing agency.

D. Child Safety Warning Label: Provide sample label including drawing illustrating mounting location on window.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roller shades to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Roller Shades: Full-size units equal to 5 percent of quantity installed for each size, color, and shadeband material indicated, but no fewer than five square yards shade material.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Do not take field dimensions until adjacent and gypsum board work is installed.
2. Allow clearances for operating hardware of operable glazed units through entire operating range.
3. Notify Architect of installation conditions that vary from Drawings.
4. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.10 WARRANTY

A. Manufacturer Warranty:

1. Limited Lifetime Warranty: Manufacturer agrees to warrant roller shade system against original defects in materials and workmanship for the life of the shade not to exceed 25 years from date of substantial completion.

2. Exclusions: Manufacturer does not warrant against damage caused by:

a. Accidents.
b. Misuse.
c. Abuse.
d. Alterations.
e. Improper cleaning.
f. Improper maintenance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements,:

1. Insolroll.
2. Draper Inc.
3. MechoShade Systems, Inc.

B. Basis-of-Design Product: Subject to compliance with requirements, provide Lu-Tek Inc.; ML Series 40 or comparable product by one of the following:

1. Insolroll.
2. Draper Inc.
3. MechoShade Systems, Inc.

C. Basis-of-Design Product: Subject to compliance with requirements, provide Lu-Tek Inc.; DML Series 50 or comparable product by one of the following:

1. Lu-tek.

2. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 WINDOW TREATMENT SCHEDULE

A. Roller Shade System: Manual, chain operated, single roll, shade system.

1. E-Screen to include: Refer to window drawing schedule

2. Windows without blinds include: Refer to window drawing schedule

B. Roller Shade System: Manual, chain operated dual roller shade system.

a. E Screen and Avila Twilight Black out windows with the side track include: Refer to window drawing schedule

2.3 MANUAL OPERATING SYSTEMS

A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.

1. Bead Chains: Manufacturer's standard

a. Loop Length: Full length of roller shade Limit Stops: Provide upper and lower ball stops.
b. Chain-Retainer Type: ***Final installation to be coordinated with shop drawings approval by project team. (Clip, jamb mount, Chain tensioner, jamb mounted, Chain tensioner, sill mounted).***

c. Warning Label: Apply child safety warning label to window frame in location acceptable to authority having jurisdiction.

2. Spring Lift-Assist Mechanisms: Manufacturer's standard for balancing roller-shade weight and lifting heavy roller shades.

a. Provide for shadebands that weigh more than 10 lb (4.5 kg) or for shades as recommended by manufacturer, whichever criteria are more stringent.

2.4 SINGLE ROLLER SYSTEMS

A. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Roller Drive-End Location: ***Final installation to be coordinated with shop drawings approval by project team*** (Right side of inside face of shade, Left side of inside face of shade).
2. Direction of Shadeband Roll: Regular, from back of roller.
3. Shadeband-to-Roller Attachment: Removable spline fitting integral channel in tube.

B. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.

C. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.

2.5 DUAL ROLLER SYSTEMS

A. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.

1. Double-Roller Mounting Configuration: Offset, outside roller over and inside roller under
2. Inside Roller:

a. Drive-End Location: ***Final installation to be coordinated with shop drawings approval by project team*** (Right side of inside face of shade, Left side of inside face of shade).
b. Direction of Shadeband Roll: Regular, from back of roller.

3. Shade band-to-Roller Attachment: Removable spline fitting integral channel in tube

B. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller mounting configuration, roller assemblies, operating mechanisms, installation accessories, and installation locations and conditions indicated.

C. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.

2.6 SHADE BANDS, SINGLE ROLLER SYSTEMS

A. Shade bands:

1. Shade band Material: E-Screen and Avila Twilight
2. Shade band Bottom (Hem) Bar: Steel or extruded aluminum.

    a. Type: Enclosed in sealed pocket of shadeband material

2.7 SHADE BANDS, DUAL ROLLER SYSTEMS

A. Inside Shadebands:

1. Shadeband Material: E- Screen Light-filtering fabric
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.

    a. Type: Enclosed in sealed pocket of shadeband material

B. Outside Shadebands:

1. Shadeband Material: Avila Twilight Light-blocking fabric
2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.

    a. Type: Enclosed in sealed pocket of shadeband material

2.8 SHADEBAND MATERIALS

A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.

1. Source: **E-screen**
2. Type: **PVC-coated fiberglass**
3. Weave: Mesh Basketweave .

4. Openness Factor: 5 percent.
5. Color: As selected by Architect from manufacturer's full range.

C. Light-Blocking Fabric: Opaque fabric, stain and fade resistant.

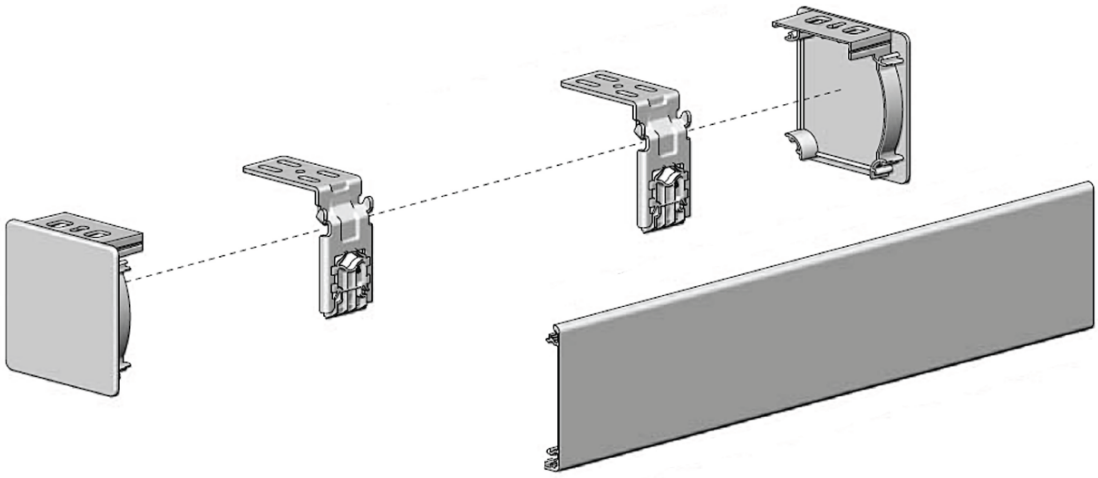
1. Source: Avila Twilight.

2. Type: Polyester with foamed-acrylic backing
3. Features: Washable, Antistatic treatment
4. Color: As selected by Architect from manufacturer's full range.

2.9 INSTALLATION ACCESSORIES

A. Front Fascia: Aluminum extrusion that conceals front of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.

1. Shape: Flat
2. Height: Manufacturer's standard height required to conceal roller and shadeband when shade is fully open, but not less than 4 inches (102 mm) single, 5 inches (127 mm) dual.



3. Height: Manufacturer's standard height required to enclose roller and shadeband when shade is fully open, but not less than 4 inches (102 mm) single, 5 inches (127 mm) dual.

B. Side Channels: designed to eliminate light gaps at sides of shades as shades are drawn down. Provide side channels with shadeband guides or other means of aligning shadebands with channels at tops.

C. Chain Retainer: ***Final installation to be coordinated with shop drawings approval by project team. (***Jamb-mounted or Frame-mounted) hold downs for chain.

D. Installation Accessories Color and Finish: As selected from manufacturer's full range.

2.10 ROLLER-SHADE FABRICATION

A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.

B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):

1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch (6 mm) per side or 1/2-inch (13-mm) total, plus or minus 1/8 inch (3.1 mm). Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch (6 mm), plus or minus 1/8 inch (3.1 mm).
2. Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.

C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:

1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.

2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.

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

3.2 ROLLER-SHADE INSTALLATION

A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.

1. Opaque Shadebands: Located so shadeband is not closer than 2 inches (51 mm) to interior face of glass. Allow clearances for window operation hardware.

3.3 ADJUSTING

A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.

C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

D. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION 12413