PROJECT MANUAL
VOLUME 1 of 2 (Division 00 – Division 13)
• FOR SOLICITATION •

EXCHANGE IMAGE UPGRADE

HURLBURT FIELD, FLORIDA

AAFES PROJECT NUMBER 0944-14-000004

24 March 2017

PWBA ARCHITECTS, INC.
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PWBA 140704
SECTION 00 01 02

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END OF SECTION
SECTION 00 04 04
SUBSTITUTIONS

PART 1 - GENERAL

1.01 CONTRACTING OFFICER’S APPROVAL

A. The contract is based on materials and methods described in the contract documents.
B. The Contracting Officer will consider proposals for substitution of materials, equipment and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Contracting Officer to evaluate the proposed substitution.
C. Do not substitute materials or equipment, unless such substitution has been specifically approved for this Work by the Contracting Officer.
D. All substitution requests submitted during solicitation (bid phase) must be received by the Contracting Officer no later than 10 days prior to solicitation due date, in which case the Bidder will not be liable for costs of the Contracting Officer’s review.

1.02 “OR EQUAL”

A. Where the phrase “or equal” or “or approved equivalent” or “or equal as approved in advance by the Contracting Officer” occurs in the Contract Documents, do not assume that material and equipment will be approved as equal by the Contracting Officer unless the item has been specifically approved for this work by the Contracting Officer.
B. The decision of the Contracting Officer shall be final.

1.03 AVAILABILITY OF SPECIFIED ITEMS

A. Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the Work.
B. In the event specified item or items will not be so available, notify the Contracting Officer 10 days prior to receipt of proposals.
C. Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, will be back-charged as necessary and shall not be borne by EXCHANGE.

1.04 SUBSTITUTIONS FOLLOWING AWARD OF CONTRACT

A. Substitutions for Cause: Not later than 15 days prior to time required for preparation and review of submittals. The submittal must include a justification explaining the rationale for the requested substitution.
B. Substitutions for Convenience: Not allowed after contract award.

PART 2 – PRODUCTS (NOT USED)
PART 3 – EXECUTION (NOT USED)

END OF SECTION
PART 1  GENERAL

1.01  STATEMENT OF WORK

A. The work covered by these specifications consists of furnishing all plant, supervision, labor, equipment, materials and incidentals necessary to perform all operations required to complete the work, all in accordance with these specifications and the applicable drawings, and subject to the terms and conditions of the contract.

1.02  THE WORK TO BE PERFORMED IS LOCATED AT HURLBURT FIELD, FLORIDA.

A. Principal Features:
   1. The work to be performed in connection with this project includes, but is not necessarily limited to the following:
      a. Remodeling of Retail Sales Area, remodeling of Administration Area, remodeling of the Mall, remodeling of rest rooms, and provisions for various new food activities as well as remodeling in the ODL Area and a new MCSS area and a new Alterations area. Additional work is required for several new commodities areas. Also, enclosure of an existing covered entry to create a Vestibule. Much of this work will be carried out in phases as the store will remain in operation during construction.
      b. Provide required mechanical and electrical systems upgrades and modifications to support new work.
      c. Provide all other work shown on the drawings and/or described in the specifications and miscellaneous incidental work not shown which is required for the complete work of the project.

B. The Contractor is advised to take note of the following General Provisions of the Contract: Cleaning up; Material and Workmanship; Accident Prevention; Protection of Existing Vegetation, Structures, Utilities and Improvements; Operation and Storage Areas; Site Investigation; Permits and Responsibilities. Copies of the General Provisions may be obtained from the Contracting Officer.

1.03  SPECIAL BASE REQUIREMENTS

A. Regular business hours during the week for the Department of Public Works are 7:00AM to 4:00PM, Monday through Friday, excluding Federal Holidays. The EXCHANGE normal business hours of operation are from 9:00AM to 7:00PM, Monday through Saturday and 10:00AM to 8:00PM on Sundays. On Holidays the EXCHANGE is open from 10:00AM to 6:00PM. Due to the unique nature and aggressive schedule of this project, the Contractor may be required to work 24 hours a day/ 7 days a week. Also, many items of work can only be performed at night after hours once the EXCHANGE is closed to customers. The EXCHANGE will be available to the Contractor on a 24/7 basis. A 24 hour advance notice to the EXCHANGE General Manager is required to confirm on site security is available during non-operation hours. Failure on the part of the Contractor to give this advance notice may result in the facility not being accessible for work. The Contractor shall coordinate this work schedule closely with the EXCHANGE store manager and notify the Installation Military Police prior to performing work after normal business hours.

B. The Contractor is to be familiar with the requirements for gaining daily access to the base. All workers, subcontractors and material deliveries will require permits to gain site entry.

C. Hurlburt Field may require special access requirements during times of heightened security measures and/or force protection events requiring the Contractor to adjust schedules and access accordingly. Advance notice will be given to the Contractor as soon as possible in the event of such an occurrence.

1.04  UTILITIES (WATER, GAS AND ELECTRICITY)

A. Existing water and electricity sources may be used on this project.
B. The Contractor will not be charged for consumption of utilities (water, gas and electricity) during this project.

C. The Contractor shall provide and use proper backflow prevention devices. The Contractor shall provide documentation of proper/current certification of installers.

1.05 LAYING OUT WORK

A. Dimensions and elevations indicated in layout of work shall be verified by the Contractor. Discrepancies between drawings, specifications, and conditions shall be referred to the Contracting Officer in writing for adjustment before work affected is performed. Failure to make such notifications shall place responsibility upon the Contractor to carry out work in a satisfactory and workmanlike manner.

B. The Contractor shall be held responsible for the location and elevation of all the construction contemplated by the construction documents.

C. Prior to commencing work, the Contractor shall carefully compare and check all Architectural, Civil, Structural, Mechanical, and Electrical drawings, each with the other, that in any way affect the locations of elevation of the work to be executed by him, and should any discrepancy be found, he shall immediately report the same to the Contracting Officer for verifications and adjustment. Any duplication of work made necessary by failure or neglect on the Contractor's part to comply with this function shall be done at his sole expense.

D. The drawings accompanying these specifications indicate generally the design and arrangement of all apparatus, fixtures, accessories, etc. necessary to complete the work required. The exact location or arrangement of equipment is subject to minor changes necessitated by field conditions and shall be made as required without additional cost to EXCHANGE. Measurements shall be verified by actual observations at the construction site, and the Contractor shall be responsible for all work fitting into place in a satisfactory and workmanlike manner meeting the approval of the Contracting Officer.

1.06 EXISTING OVERHEAD OR UNDERGROUND WORK

A. Carefully check the site where this project is to be erected and observe any overhead wires and equipment. Any such work shall be moved, replaced, or protected, as required, whether or not shown or specified.

B. Attention is directed to the existence of pipe and other underground improvements which are shown on the drawings. All reasonable precautions shall be taken to preserve and protect all such improvements shown on the drawings.

C. Locations of underground lines, shown on the drawings, are based on the best available sources, but are to be regarded as approximate only. Exercise extreme care in locating and identifying these lines before excavating in adjacent areas.

1.07 INTERRUPTION OF EXISTING UTILITIES SERVICES

A. The Contractor shall perform the work under this Contract with a minimum of outage time for all utilities. Interruption shall be by approved section of the utility. In some cases, the Contractor may be required to perform the work while the existing utility is in service. The existing utility services may be interrupted only when approved by the Contracting Officer. When it is necessary to interrupt the existing utilities, the Contractor shall notify the Contracting Officer and facilities engineer in writing at least seven days in advance of the time he desires the existing service to be interrupted. The interruption time shall be kept to a minimum. Depending upon the activities at the facility which require continuous service from the existing utility, an interruption may not be subject to schedule at the time desired by the Contractor. In such cases the interruption may have to be scheduled at a time of minimum requirement of demand for the utility. The amount of time requested by the Contractor for interruption of existing utility services shall be as approved by the Contracting Officer.
1.08 EXCAVATION
   A. Prior to commencing any excavation work the Contractor shall obtain a valid Excavation Permit, from the Facilities Engineers Office. It shall be the Contractor's responsibility to obtain the necessary signatures and coordination for the permit.

1.09 WELDING PERMIT
   A. Prior to beginning any welding, use of open flame device, or any activity that produces sparks, obtain a "hot work permit" from Fire Emergency Services. The permit shall be renewed each day welding or open flame devices will be used. Depending on the type and location of hot work, these permits can be issued for multiple days.

1.10 BARRICADES AND WARNING DEVICES
   A. The Contractor shall provide barricades and lighting devices, in accordance with Manual for Uniform Traffic Control Devices by the State Department of Transportation, latest Edition, at all points of excavation and construction in vehicle traffic areas.

1.11 PROTECTION FOR OPEN FLAME DEVICES
   A. When open flame and/or spark producing devices, i.e., acetylene oxygen welding equipment, electric arc welding, etc., are employed for job accomplishment, the following procedures are mandatory:
      1. Inspect all surroundings and equipment to insure that combustible substances are not present in any area where contact of metal at a temperature above the flashpoint of any compound is possible.
      2. Ensure that no open containers or spills of combustible substances are present.
      3. Ensure that ignition is not possible by conduction, convection, radiation, or dispersion of molten metal.
      4. Proper protection equipment and practices will be used, i.e., fireproof blankets, wetting of surrounding area, removal of combustible materials where practicable, earth filled backing and portable fire extinguishers of proper type on hand.
      5. When the above devices are being used notify the Installation Fire Department 24 hours ahead of usage.

1.12 FIRE PROTECTION
   B. The Contractor shall at all times maintain good housekeeping practices to reduce the risk of fire damage. All scrap materials, rubbish, and trash shall be removed daily from in and about the building and shall not be permitted to be scattered on adjacent property.
   C. Suitable storage space shall be provided 50 feet minimum outside the building area for storing flammable materials and paints; no storage will be permitted in the building. Excess flammable liquids being used inside the building shall be kept in closed metal containers and removed from the building during unused periods.
   D. Contractor shall provide a fire extinguisher at each location where cutting and welding is being performed. Where electric or gas welding or cutting is done, interposed shields of incombustible material shall be used to protect against fire damage due to sparks and hot metal. When temporary heating devices are used, a watchman shall be present to cover periods when other workmen are not on the premises.
   E. The Contractor shall provide fire extinguishers in accordance with the recommendations of NFPA No. 10 and 241. However, in all cases a minimum of four fire extinguishers shall be available for each building.
1.13 WORK BY OTHERS (IF APPLICABLE)
   A. Work not included: Except for such auxiliary work as is shown or specified or is necessary as a part of the construction, the following work is not included in the Contract:
      1. Any work shown, but marked "NOT IN CONTRACT" (NIC).
      2. Any work indicated to be furnished and installed by the EXCHANGE or AAFES (EF/EI).
      3. Any work indicated to be furnished and installed by the Vendors or Concessionaires.

1.14 EXCHANGE-FURNISHED AND INSTALLED EQUIPMENT (IF APPLICABLE)
   A. See Specification Section 01 10 17 - Exchange Furnished and Installed Equipment (EF/EI).

1.15 EXCHANGE FURNISHED-CONTRACTOR INSTALLED EQUIPMENT (IF APPLICABLE)
   A. See Specification Section 01 10 18 - Exchange Furnished Contractor Installed Equipment (EF/CI).

1.16 ALIGNMENT OF JOINTS IN FINISH MATERIALS
   A. It shall be the responsibility of the Contractor to make certain in the installation of jointed floor, wall, and ceiling and pavement materials that:
      1. The joints line through in a straight line and in both directions wherever possible.
      2. The joints relate to all openings and breaks in the structure and be symmetrically placed wherever possible. This includes heating registers, light fixtures, equipment, etc.
      3. If, because of the non-related sizes of the various materials and locations of openings, etc., it is not possible to accomplish the above, the Contractor shall meet with the Contracting Officer to determine the most satisfactory arrangement. The Contractor shall establish center lines for all trades.

1.17 INTEGRATING WORK
   A. All streets, buildings, and other improvements shall be protected from damage.
   B. Contractor's operations shall be confined to the immediate vicinity of the project work and shall not in any way interfere with or obstruct the ingress or egress to and from street or adjacent property.
   C. If new work is to be connected to existing work, special care shall be exercised not to disturb or damage the existing work more than necessary. All damaged work shall be replaced, repaired, and restored to its original condition at no cost to the EXCHANGE.

1.18 HEADROOM UNDER PIPES
   A. All horizontal runs of plumbing and heating pipes and/or electrical conduit suspended from ceilings shall provide for a maximum headroom clearance, but in no case shall this clearance be less than 7'-0" without written consent from the Contracting Officer. Where piping or conduit is left exposed within a room, the same shall run true to plumb, horizontal or intended planes. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.

1.19 PATCHING GOVERNMENT-OWNED FACILITIES
   A. Government-owned structures, facilities, streets, curbs, walks, etc., that are damaged or removed due to required excavations or other construction work, shall be patched, repaired or replaced, and be left in their original state of repair by the Contractor, to the satisfaction of the Contracting Officer and of authorities having jurisdiction thereof.

1.20 LOCATION OF EQUIPMENT AND PIPING
   A. Drawings showing location of equipment, piping, ductwork, etc., are diagrammatic and job conditions shall not always permit their installation in the location shown. When this situation occurs, it shall be brought to the Contracting Officer's attention immediately and the relocation determined in a joint conference. The Contractor will be held responsible for the relocating of any items without first obtaining the Contracting Officer's approval. He shall remove and relocate such items at his own expense if so directed by the Contracting Officer.
B. On the project site where work occurs, it is not anticipated that any of the following will be encountered. If encountered, do not disturb these items or similar items:
1. Buried tanks.
2. Buried piping monitoring wells.
3. Oil/water separators.

1.21 OVERLOADING
A. The Contractor shall be responsible for overloading any part or parts of structures beyond their safe calculated carrying capacities by placing of materials, equipment, tools, machinery, or any other item thereon. No loads shall be placed on floors or roofs before they have attained their permanent and safe strength.

1.22 STANDARDS
A. Any material specified by reference to the number, symbol, or title of a specific standard such as Commercial Standard, a Federal Specification, a trade association standard, or other similar standard shall comply with the requirements in the latest revision thereof, and any amendment or supplement thereto, in effect on the date of invitation for proposals, except as limited to type, class, or grade, or modified in such reference, and except as otherwise indicated.
B. The standard referred to, except as modified in the specifications, shall have full force and effect as though printed in these specifications. These standards are not furnished to bidders for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements.
1. Where Federal Specifications are referred to as a measure of quality and standard, they refer to Federal Specifications established by the Procurement Division of the United States Government and are available from the Superintendent of Documents, U.S. Government Printing Office.
2. Where Federal Specification numbers are used, they refer to the latest edition including amendments thereto.
3. Where Commercial Standards are referred to as a measure of quality, standard, and method of fabrication, they refer to Commercial Standards issued by the U.S. Department of Commerce.
4. Where ASTM Serial Numbers are used, they refer to the latest tentative specifications, standards specifications, standards methods, or standard method of testing issued by the American Society for Testing and Materials.

1.23 CERTIFICATE OF CONFORMANCE
A. Except where tests and/or inspections in connection with structural materials are specified or required by applicable laws, rules, and regulations, manufacturer's certificate covering conformance with the requirements of the above mentioned Federal Specifications and Commercial Standards may be acceptable in lieu of such items. Such certificates shall be furnished to the Contracting Officer for all items so specified.

1.24 OCCUPANCY BY THE EXCHANGE
A. EXCHANGE shall reserve the right and privilege of partial occupancy during and prior to the absolute completion of the total work. Access shall be allowed at all times to the EXCHANGE and its own Contractors in the endeavor.
B. Contractor shall maintain the means of egress for facility occupants at all times during demolition and construction phases.

1.25 TESTS AND REPORTS
A. See Specification Section 01 40 00 - Quality Requirements.
B. No geotechnical report was prepared for this project. Conditions are not expected to be materially different from those obtaining when building and site improvements were originally executed.
1.26 REFERENCES
A. All references to the word "Government" or "EXCHANGE" in the specifications shall mean Army and Air Force Exchange Service (AAFES).
B. Wherever the word "provide" is used in the Contract Documents as a directive, it shall be interpreted as meaning "provide and install completely and ready for use".
C. Definitions:
   1. Vendor: Person or persons selling any material item.
   2. Base, Post, Installation or Facility: Military facility where the project is being built or remodeled.
   3. Concessionaire: Person who is directly responsible for the lease of and operation of the concessions such as Beauty Shop, Barber Shop, and Laundry/Dry Cleaners.
   4. Architect-Engineer: That person or firm responsible for preparing the working drawings and specifications.
   5. AAFES or EXCHANGE: Army and Air Force Exchange Service.
   6. Inspection Agency: Project Inspector contracted by EXCHANGE.

1.27 TOXIC MATERIALS
A. Removal or disposal of toxic materials or asbestos is not included in this contract. If the Contractor encounters such materials, he shall immediately notify the Contracting Officer.
B. Abatement of hazardous materials is not part of the work of this Contract. If hazardous materials are encountered or suspected, the General Contractor shall stop work immediately and contact the EXCHANGE Contracting Officer for direction on how to proceed.

PART 2 – PRODUCTS (NOT USED)
PART 3 – EXECUTION (NOT USED)
SECTION 01 10 17
EXCHANGE FURNISHED AND INSTALLED EQUIPMENT (EF/EI)

PART 1 - GENERAL

1.01 EXCHANGE FURNISHED AND INSTALLED PROPERTY (EF/EI)
   
   A. Certain items of equipment will be furnished and installed by EXCHANGE. See drawing references to (EF/EI)
   B. The Contractor shall provide for and cooperate with personnel installing EXCHANGE furnished materials and equipment, should overlap of work occur.
   C. Schedule: Contractor shall schedule early completion of designated areas for beneficial occupancy by EXCHANGE usage prior to completion of entire project per approved Phasing plans.
   D. EXCHANGE will furnish and install equipment as indicated on Fixture and/or Equipment Plans in the drawings.
   
   E. Contractor’s Duties:
      1. Provide access for EXCHANGE personnel.
      2. Coordinate work and cooperate with the installers of the EF/EI equipment so that installation can be accomplished in accordance with construction schedule.
      3. Provide mechanical and electrical connections to EF/EI equipment and building systems where indicated in the contract documents.
      4. Provide security for designated areas.
      5. Schedule equipment delivery dates and installation times to coordinate with the overall schedule. Provide EXCHANGE advance notice so equipment can be ordered on time.
   
   F. EXCHANGE Duties:
      1. Inspect designated area prior to use and issue statement of acceptance of area for installation of property.
      2. Make final mechanical and electrical connections between EF/EI property and building systems where indicated in the contract documents.
      3. Provide custodial services for designated areas during use after beneficial occupancy.

1.02 DELIVERY DATE CHANGES

   A. Requests by Contractor to change designated delivery dates shall be made in writing at least 30 days in advance of the designated delivery date. If the Contractor is not ready to accept delivery of EXCHANGE furnished property the Contractor shall be responsible for storage and re-delivery cost. Should EXCHANGE be unable to effect the change, or should the Contractor fail to submit his request within the time stated above, the Contractor’s obligation under this contract and as stated herein shall not be relieved and further, the Contractor will have no basis upon which to file a claim under these conditions.

1.03 EXCHANGE ACTIVITIES AFFECTING PROGRESS OF WORK:

   A. Retail Sales Areas: Schedule date of installation of fixtures and possession of these areas 30 days prior to completion of each phase of the project. Acceptance will be phased.
   B. Serving Areas & Food Preparation Areas: Schedule date of use and possession of food preparation serving areas 30 days prior to completion of project.
   C. MPA: Schedule date of installation of storage shelving and equipment 30 days prior to completion of project. Work in this area is EF/EI unless noted otherwise.
   D. Construction in each area at date scheduled for its use and possession by EXCHANGE shall be sufficiently complete, in accordance with Contract Documents, so that EXCHANGE may occupy the area for the use for which it is intended. Comply with Contract Clauses titled Inspection of Construction, and Use and Possession Prior to Completion.
1.04 ACCEPTANCE OF AREAS FOR BENEFICIAL OCCUPANCY

A. Inspection: Prior to acceptance by EXCHANGE of an area for beneficial occupancy, the Contracting Officer will conduct an inspection of the specific area. A list of deficiencies will be provided to the Contractor.

B. Acceptance: If the Contracting Officer determines the specific area is sufficiently complete for beneficial occupancy by EXCHANGE, the area will be accepted in writing with the exception of the deficiencies listed. The deficiencies listed shall be completed or corrected prior to final acceptance at the completion of the project.

C. Damage: Damage resulting from EXCHANGE’S use will not be considered the Contractor's responsibility.

D. Refer to clause entitled "Final Inspection and Acceptance" of the EXCHANGE "General Provisions."

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION

3.01 FINAL CONNECTIONS

A. All final electrical connections to EXCHANGE and Vendor furnished and installed equipment shall be made by the Contractor as part of the construction contract. The GC shall construct all openings, furnish and install required sleeves and conduit, and furnish and install all reinforcing, miscellaneous supports, angles, plates, anchors, and bolts necessary to secure EXCHANGE-furnished equipment in place. Final hookup of plumbing fixtures is by the GC.

1. Final connection for cooler and freezer boxes shall be by cooler and freezer vendor.

B. The Contractor shall provide for and cooperate with personnel installing EXCHANGE-furnished materials and equipment should overlap of work occur.

3.02 SCHEDULE OF MATERIALS AND EQUIPMENT (EF/EI)

A. Equipment to be furnished and installed by EXCHANGE is as follows and as indicated on the Drawings:

1. All store shelving, fixtures, service counters, and work stations in Customer Services and Retail Sales. (Electrical & Mechanical service, connections, lighting and fire protection by Contractor. Plumbing runs to fixtures by General Contractor.)

2. All store shelving, fixtures, service counters, work stations, and fitting rooms in MCSS, MCSS MPA, and Alterations areas.

3. Barber Shop: Work stations, fixtures, equipment and furnishings. (Storage Room built-in shelving by Contractor. Plumbing runs to fixtures by General Contractor. Contractor provides electrical junction boxes and plumbing stub-outs only)

4. Food Activities: Fixtures, equipment and furnishings. Certain items of Foodservice Equipment will be EF/CI. See drawings for sourcing of this equipment.

5. Food Court: Beverage/condiment stations, furnishings, fixtures and equipment. See schedules on drawings.

6. Food Concepts/Kitchen: See equipment schedules for the respective activities. Fixtures, food service/prep equipment, dry storage shelving, safes, cash registers, metal wall panels, menu boards, concept signage, decorative lighting fixtures, and small wares packages. See schedules. (Built-in service counters, casework and exhaust vent hoods by Contractor unless noted otherwise on individual Food Concept Equipment Schedules.)

7. Walk-in Coolers & Freezers. General Contractor furnishes power and junction boxes for units and provides hook-up of power to equipment. Refrigerant work is EF/EI. Contractor furnishes and installs lights in units as well as fire sprinkler system.

8. Alterations: Shelving, fixtures, service counters, equipment and work stations.

9. Telephone system equipment, devices and cabling. (Rough-ins and final points of connection by Contractor.)

10. Intrusion Detection System additions and modifications.

END OF SECTION
SECTION 01 10 18
EXCHANGE FURNISHED, CONTRACTOR INSTALLED EQUIPMENT (EF/CI)

PART 1 - GENERAL

1.01 EXCHANGE FURNISHED / CONTRACTOR INSTALLED EQUIPMENT (EF/CI):

A. EXCHANGE furnished/Contractor installed equipment shall be handled in accordance with the "Army and Air Force Exchange Service General Provisions" clause entitled "Exchange Furnished Property."

B. The material noted below will be furnished by the Exchange and shall be installed by the Contractor. See drawing references to (EF/CI). The Contractor shall provide for and cooperate with personnel furnishing the designated material.

C. All food service equipment must be approved by the National Sanitation Foundation, NSF

D. Contractor's Duties:
   1. Designate required delivery date for each product. Notify the Contracting Officer in writing at least 60 days in advance of the date that EXCHANGE furnished equipment and furnishings will be needed. Shop drawings indicating dimensional locations of all plumbing and electrical rough-ins will be furnished by EXCHANGE.
   2. The equipment will be received at the job site by a representative of EXCHANGE who will jointly, with the Contractor, verify condition and quantities. The representative will then effect receipted transfer of custody of the equipment to the Contractor.
   3. Unload, handle, store (on-site), protect, uncrate, assemble, install, set in final position, align, join, level, and make all utility connections to all items of equipment. Installation shall be performed in accordance with the specifications, equipment plans, and schedules shown on the Drawings and the rough-in drawings provided by EXCHANGE.
   4. Construct all openings, furnish and install required sleeves and furnish and install all reinforcing, miscellaneous supports, angles, plates, anchors, and bolts necessary to secure EXCHANGE furnished equipment in place.
   5. Repair or replace items damaged as a result of Contractor's operations.
   6. Apply finish indicated, if any.
   7. The installation shall be complete in all respects, including mechanical and electrical hook ups, and put into good operating condition.

E. EXCHANGE Duties:
   1. Deliver all EXCHANGE furnished items to the job site. Schedule delivery date with supplier in accordance with Progress Chart.
   2. Provide Contractor with installation drawings and instructions.
   3. Provide Contractor with shop drawings indicating dimensional locations of all plumbing and electrical rough-ins.

1.02 DELIVERY

A. Contractor shall unload, handle, store, protect, uncrate, assemble, set in final position, align, join, and level all Exchange-Furnished material, and shall make all utility connections thereto. EXCHANGE will provide supervision for installation of the material.

B. The material will be received at job site by a representative of the local EXCHANGE who, together with the Contractor, will jointly verify conditions and quantities. The representative of the local EXCHANGE will then effect receipted transfer of custody of the material to the Contractor. Material damaged by or during construction operations shall be replaced at no additional cost to EXCHANGE.

1.03 FAILURE TO VERIFY

A. Failure to execute above required verifications shall not relieve the Contractor of responsibility for proper installation of the material, which shall be installed without additional cost to EXCHANGE.
1.04 DELIVERY DATE CHANGES:
   A. Requests by Contractor to change designated delivery dates shall be made in writing at least 60
days in advance of the designated delivery date. If the Contractor is not ready to accept delivery
of EXCHANGE furnished equipment the Contractor shall be responsible for storage and
delivery cost. Should EXCHANGE be unable to effect the change, or should the Contractor fail
_to submit his request within the time stated above, the Contractor's obligation under this
contract and as stated herein shall not be relieved and further, the Contractor will have no basis
upon which to file a claim under these conditions.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 INSTALLATION
   A. The GC shall construct all openings, furnish and install required sleeves and conduit, and
   furnish and install all reinforcing, miscellaneous supports, angles, plates, anchors, and bolts
   necessary to secure EXCHANGE-furnished equipment in place. All final electrical connections
to EXCHANGE-furnished equipment shall be made by the Contractor as part of the
Construction Contract.

3.02 SCHEDULE OF MATERIALS AND EQUIPMENT (EF/CI)
   A. EXCHANGE Furnished Equipment: EXCHANGE will furnish the equipment indicated for
   installation by the Contractor, as follows:
   1. Food Concept menu boards, signage, specialty lighting and water filter system
   2. Branded Graphics.
   3. Exterior Signage - G. C. to provide power and hookup.
   4. Retail Sales:
      a. VIRA Clipless wall system and cornice lights in Soft lines area.
      b. Specialty ceiling suspended accent fixtures / soffits / clouds.
   5. Signage for Commodities (Tactical & GNC), Retail Sales, Food Activities, etc., with
electrical service and hook-up for lighted signs by GC.
   6. Signage for Food Activities, with electrical service and hook-up for lighted signs by GC.
   7. Other items as indicated on Furniture and Equipment Schedule.
   B. Refer to individual schedules and notes on each sheet.
   C. Contractor is responsible to provide all MEP connections and final hookups at all EF/EI
equipment and fixtures as required as well as at the EF/CI equipment.

END OF SECTION
SECTION 01 10 60
SAFETY POLICIES AND PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Contractor-required health and safety plan.
   1. Contractor is responsible for reading the Risk Assessment Plan and following the directions therein.
   2. Contractor must maintain OSHA permissible exposure limits related by the risk assessment: That is, 25 ppm (170 mg/cubic meter) during any 8 hour work shift for a 40-hour week

B. Sample Safety Plan: Attached.

C. Sample Construction Hazard Plan: Attached.

1.02 RELATED SECTIONS

A. Section 01 33 00 - Submittals: Construction Hazard Plan, Job Safety and Health Plan, Emergency Response Plan.

B. Section 01 35 43 - Environmental Protection.

C. Section 01 78 39 - Project Record Documents.

1.03 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
   1. OSHA 1910 REG - 29CFR, OSHA 1910.120

1.04 SUBMITTALS

A. Submittals for EXCHANGE Approval: The following items shall be submitted for EXCHANGE approval:
   1. Designation of Safety Representative: The Contractor shall designate in writing a qualified employee, OSHA Trained under 1910.120, responsible for the overall supervision of all accident prevention activities. Duties shall include ensuring applicable safety requirements are incorporated into work methods and inspecting the job site to ensure that safety measures and instructions are actually being applied. This person shall be on site at all times that work is in progress.
   2. The Contractor shall be trained/certified in OSHA 1910.120 procedures. All other employees performing site work will meet OSHA 1910 training requirements for their job capacity.

B. Submittals for Information Only: The following items shall be Contractor certified:
   1. Job Hazard Analysis: Contractor shall develop a job hazard analysis for presentation at the Pre-Construction Conference. The Contractor's job hazard analysis shall list potential hazards that could arise during the course of the work.
   2. Job Safety and Health Plan.
      a. The Contractor shall develop a Job Safety and Health Plan for presentation at the Pre-Construction Conference. The Contractor's Safety Plan shall make whatever provisions are necessary to conduct the work in accordance with current OSHA standards.
      b. The Safety and Health Plan must specifically address the excavation portion of construction and will be specific to perchloroethylene (tetrachloroethylene) (PCE), and incorporate decontamination procedures for personnel and equipment, continuous vapor monitoring, a prohibition against eating in proximity to the site, and a prohibition against the smoking of tobacco products in the proximity to the site.
      c. The following are minimum requirements for the Safety and Health Plan:
1) The Contractor is responsible for all compounds and degradation products addressed by the Risk Assessment Plan.

2) Specialized Designs: Specialized designs will be provided when the situation requires. Examples of such designs include, but are not limited to, vapor barriers in areas of known vapor hazard.

3) Safety Plans: Safety Plans will be the responsibility of the Contractor for construction areas identified by the installation and/or EXCHANGE as areas of known hazards only. These plans are required by 29 CFR 1910 and are the responsibility of the Contractor. This requirement will be coordinated through the Health and Safety Program of the Installation by the Contractor.

4) Minimum Requirements for the Safety and Health Plan are as follows:
   (a) Must be kept on site, and must be written.
   (b) Will contain a hazard analysis (safety and health risk) for each site task and operation (to be supplied by the Installation).
   (c) Will include employee training (per paragraph (3) of 1910.120).
   (d) Will include personal protective equipment to be used by employees for each of the site tasks and operations (paragraph (g) (5) of 1910.120).
   (e) Will include provision for medical surveillance (paragraph (f) of 1910.120).
   (f) Will include the frequency and types of air monitoring, personal monitoring, environmental sampling techniques, instruments to be used (their maintenance and calibration).
   (g) Will include a site control program (per paragraph (d) of 1910.120) to be coordinated with the installation.
   (h) Will include a decontamination procedure (per paragraph (k) of 1910.120).
   (i) Will include an emergency response plan (per paragraph (1) of 1910.120).
   (j) Will include a confined space entry procedure (per 1910.146, 147 or program equivalent).
   (k) Will include provision for spill containment (per paragraph (j) of 1910.120).
   (l) Will include pre-entry briefings (prior to each site task activity) for all employees involved in the task, supervision, or emergency response.
   (m) Written verification of adherence to the "plan" by a Safety and Health Supervisor is required (the supervisor must meet the 1910.120 training requirements for supervisors).
   (n) Deficiencies will be corrected immediately upon discovery and after consultation with the EXCHANGE Contracting Officer and Installation Safety Office.

d. Hazard Response Plan: The unplanned or non-predicted discovery of such hazards as transite pipe, contaminated soils, and other possible hazards will be addressed within an Emergency Response Plan (EMR) by all contractors. This requirement will be coordinated through the Health and Safety Program of the military installation by the Contractor (sample provided).

e. Material Safety Data Sheets will be maintained at the site for all hazardous materials in use.

1.05 MONTHLY SAFETY MEETINGS

A. The Installation will schedule subsequent safety meetings with Contractor and subcontractor personnel on a monthly basis. The EXCHANGE and Installation representatives will attend periodically. Minutes of safety meetings shall be prepared and signed by the Contractor. Concurrence shall be signed by the Inspection Section and the original shall be submitted to the Contracting Officer for inclusion in the contract file.

1.06 ACCIDENT REPORTING AND RECORD KEEPING

A. Accident reporting and record keeping shall be in accordance with Installation requirements. Telephonic reports of injuries or property damage will be made as soon as possible after the incident and will be followed by a copy of an Accident Report.
1.07 LIFE OF CONTRACT REQUIREMENTS
   A. The Contractor shall comply with all provisions of this Section during the life of the Contract.

1.08 HEAD PROTECTION (HARD HATS)
   A. All work sites under this Contract are designated Hard Hat Areas. The Contractor shall post the area and shall ensure that all personnel, vendors and visitors use hard hats while within the limits of the work site.

PART 2 - PRODUCTS (NOT USED)
PART 3 - EXECUTION (NOT USED)

END OF SECTION
SAMPLE

SAFETY PLAN

1. APPLICABLE PUBLICATIONS: The publications listed below form a part of this specification and are referred to in the text by the basic designation only.

1.1 US ARMY CORPS OF ENGINEERS:

EM 385-1-1 U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.2 NATIONAL FIRE PROTECTION ASSOCIATION (NFPA):

NFPA 70-1993 National Electric Code (NEC)

1.3 SOCIETY OF AUTOMOTIVE ENGINEERS (SAE):

J 994-85 Alarm, Backup, Electric-Performance, Test, and Application, Recommended Practice.

2. GENERAL: Work safety is of paramount importance. The Contractor shall comply with the Contract Clause in the Solicitation entitled ACCIDENT PREVENTION, including the U.S. Army Corps of Engineers Safety and Health Requirements Manual referred to therein in addition to the provisions of this specification.

3. SAFETY PROGRAM: The U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, and all subsequent revisions to in the Contract Clause ACCIDENT PREVENTION of this contract, are hereby supplemented as follows:

a. The Contractor shall designate an employee responsible for overall supervision of accident prevention activities. Such duties shall include:

   1. Assuring applicable safety requirements are incorporated in work methods
   2. Inspecting the work to ensure that safety measure and instructions are actually applied.

   The proposed safety supervisor's name and qualifications shall be submitted in writing for approval to the Contracting Officer's Representative. This individual must have prior experience as a safety engineer or be able to demonstrate his/her familiarity and understanding of the safety requirements over a prescribed trial period. The safety engineer shall have the authority to act on behalf of the Contractor's general management to take whatever action is necessary to assure compliance with safety requirements. The safety supervisor is required to be on the site when work is being performed.

b. Prior to commencement of any work at a job site, a preconstruction safety meeting shall be held between the Contractor and the Corps of Engineers Area/Resident Engineer to discuss the Contractor's safety program and in particular to review the following submittals:

   1. Contracts Accident Prevention Plan: An acceptable accident prevention plan, written by the prime contractor for the specific work and implementing in detail the pertinent requirements of EM 385-1-1, shall be submitted for Government approval.
2. Activity Phase Hazard Analysis Plan: Prior to beginning each major phase of work, an activity hazard analysis (phase plan) shall be prepared by the Contractor for that phase of work and submitted to the Contracting Officer's Representative for approval. A phase is defined as an operation involving a type of work presenting hazards not experienced in previous operations or where a new subcontractor or work crew is to perform work. The analysis shall address the hazards for each activity performed in the phase and shall present the procedures and safeguards necessary to eliminate the hazards or reduce the risk of an acceptable level.

c. Subsequent jobsite safety meetings shall be held as follows:

1. A safety meeting shall be held at least once a month for all supervisors on the project to review past activities, to plan ahead for new or changed operations and to establish safe working procedures to anticipate hazards. An outline report of each monthly meeting shall be submitted to the Contracting Officer's Representative.

2. At least one safety meeting shall be conducted weekly, or whenever new crews begin work, by the appropriate field supervisors or foreman for all workers. An outline report of the meeting giving date, time, attendance, subjects discussed and who conducted it shall be maintained and copies furnished the designated authority on request.

4. ACCIDENTS: Chargeable accidents are to be investigated by both Contractor personnel and the Contracting Officer.

4.1 ACCIDENT REPORTING, ENG FORM 3394: Section I, paragraph 01.D, of EM 385-1-1 and the Contract Clause entitled ACCIDENT PREVITION are amended as follows: The prime Contractor shall report on Eng Form 3394, supplied by the Contracting Officer, all injuries to his employees or subcontractors that result in lost time and all damage to property and/or equipment in excess of $2,000 per incident. Verbal notification of such accident shall be made to the Contracting Officer within 72 hours following such accidents. The written report shall include the following:

a. A description of the circumstances leading up to the accident, the cause of the accident, and corrective measures taken to prevent recurrence.

b. A description of the injury and name and location of the medical facility giving examination and treatment.

c. A statement as to whether or not the employee was permitted to return to work after examination and treatment by the doctor, and if not, an estimate or statement of the number of days lost from work. If there have been days lost from work, state whether or not the employee has been re-examined and declared fit to resume work as of the date of the report.

4.2 OSHA Requirements:

4.2.1 OSHA Log: A copy of the Contractors' OSHA Log of Injuries shall be forwarded monthly to the Contracting Officer.

A. The Contractor shall comply with all provisions of this section during the life of the contract.

4.2.2 OSHA Inspections: Contractors shall immediately notify the Contracting Officer when an OSHA Compliance Official (Federal or State Representative) presents his/her credentials and informs the Contractor that the workplace will be inspected for OSHA compliance. Contractors shall also notify the Contracting Officer upon determination that an exit interview will taken place upon completion of an OSHA inspection. (NABSA).
5. **SUBMITTALS FOR GOVERNMENT APPROVAL:** Submittals shall be in accordance with Section 01 33 00 CONTRACTOR SUBMITTAL PROCEDURES. All required submittals of items specified in this section shall be for information only, except for those items including, but not limited to, the following which shall be submitted for Government approval:

a. Written designation of safety representative.

b. Written project specific accident prevention plan.

c. Written activity phase hazard analysis plan.

END OF SAMPLE SAFETY PLAN
SAMPLE
CONSTRUCTION HAZARD PLAN

TO BE ACCOMPLISHED BY THE GENERAL CONTRACTOR FOR CONSTRUCTION AND POSTED IN ALL CONSTRUCTION TRAILERS

SHOULD AN UNPREDICTED DISCOVERY OF A HAZARDOUS MATERIAL OR CONDITION BE MADE DURING CONSTRUCTION THE FOLLOWING SEQUENCE OF ACTIONS IS REQUIRED WHEN THERE IS NO IMMEDIATE THREAT TO LIFE OR PROPERTY

<table>
<thead>
<tr>
<th>ITEM</th>
<th>FIRST ACTION</th>
<th>NOTIFY</th>
<th>TELEPHONE #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transite Pipe</td>
<td>Crease Activity in area of discovery</td>
<td>1. BCE</td>
<td>2. AAFES Contracting Officer and/or CME</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. AAFES Environmental Engineer when Unable to Contact 1,2</td>
<td></td>
</tr>
<tr>
<td>Contaminated Soil</td>
<td>Crease Activity in area of discovery cover with plastic</td>
<td>Same as above</td>
<td></td>
</tr>
<tr>
<td>Buried Munitions</td>
<td>Crease Activity</td>
<td>Same as above</td>
<td></td>
</tr>
<tr>
<td>UST</td>
<td>Same as above</td>
<td>Same as above</td>
<td></td>
</tr>
</tbody>
</table>

Other
Should there be an immediate threat to life or property, the emergency response plan for the installation, which is to be on file at the construction side, is to be followed in every detail. An example of this procedure is the rupture of a fuel line, liquid or natural gas.

END OF SAMPLE CONSTRUCTION HAZARD PLAN
SECTION 01 13 00
SAFETY REGULATIONS AND CODES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. Reference Standards.
B. Licenses and Permits
C. Safety.
D. Fire Safety.
E. Use of Lasers.
F. Ozone Depleting Substances.
G. Lead Base Paint.
H. Cleaning & Debris Control
I. Nuisance Dumping & Polluting Activities
J. Suspected Hazardous Materials
K. Oil-Filled or Impregnated Electrical Components
L. Spill Response and Reporting
M. Waste Disposal and Environmental Protection.

1.02 REFERENCE STANDARDS

A. Federal, State and Local Codes and Ordinances take precedence over these Specifications and Drawings where conflicts occur, unless the Drawings or Specifications call for more stringent requirements. Notify the Contracting Officer in writing of conflicts.
B. Comply with all applicable laws, building and construction codes, OSHA Safety and Health Regulations and applicable requirements of any governmental agency under whose jurisdiction this Work is being performed.
C. Obtain a copy of standards referenced in the various Specification Sections. Maintain a copy at the jobsite during execution of Work to which the standard applies.
D. Construction that is not governed by the contract specifications will be governed by the more stringent provisions of the latest published edition or statute adopted edition, of the following applicable codes, regulations and standards.
   1. Americans With Disabilities Act Accessibility Guidelines
   2. Army Regulations
   3. American Society of Mechanical Engineers
   4. Code of Federal Regulations
   5. Federal Acquisition Regulations
   7. International Mechanical Code
   8. International Plumbing Code
   11. Occupational Safety and Health Act
E. Other applicable codes and standards as applicable or as referenced by the individual specification Sections.

1.03 LICENSES AND PERMITS

A. The Contractor shall obtain and maintain current for the duration of this Contract, all required Federal, State and local licenses and permits. All associated fees and taxes shall be paid by the Contractor without additional cost to the Government.
B. Obtain from Installation Security all required vehicle and entry permits.
C. Obtain from the Contracting Officer any additional Installation required permits. Current permit requirements shall be provided to the Contractor at the Pre-Construction Conference.

1.04 SAFETY
A. Comply with all Federal and State regulations concerning safety of personnel and equipment. All Contractor personnel shall wear hard hats and steel toe safety shoes while on the project site. In addition, all personnel shall wear hearing protection (ear muffs or ear plugs) when inside the power plant, excluding office areas, restrooms, break rooms and other “quiet” areas.
B. Ensure that lock out, tag out procedures are established and used as directed by 29 CFR 1910.145. Comply with the lock out, tag out procedures in use. Ensure that Contractor’s personnel on site are trained on the government’s procedures.
C. Comply with all safety, traffic and protection requirements in effect on Installation. Government will brief the Contractor on these requirements at the Pre-Construction Conference.
D. Provide safety barriers around open excavations, openings in floors and other hazards created by the Contractor’s activities.
E. The Contracting Officer may direct the Contractor to cease activities which, in his opinion, are unsafe.

1.05 FIRE SAFETY
A. Comply with all fire safety and protection requirements in effect at Installation. Government will brief the Contractor on these requirements at the Pre-Construction Conference.
B. Prior to beginning any welding, use of open flame device, or any activity that produces sparks, obtain a “hot work permit” from the Installation Fire Department. The permit shall be renewed each day welding or open flame devices will be used.
C. If the contract work requires numerous days of hot work, the Contractor may elect to have one of his on-site personnel designated as a Permit Authorizing Individual (PAI). The Contractor’s PAI may issue hot work permits at the work site, thus avoiding the requirement for daily permits issued by the Fire Department.
D. The Contractor’s PAI shall be the on-site superintendent, a foreman, the Contractor’s Safety Manager, or other individual with sufficient knowledge and experience to recognize unsafe work practices or conditions and having authority to stop work immediately if such unsafe practices or conditions are observed. To be designated as a PAI, a person must schedule and successfully complete PAI certification training offered by the Installation Fire Department. PAI certification training is estimated to last 60 to 90 minutes.
E. Fire Department personnel may periodically visit the site to ensure the Contractor is complying with fire safety requirements. A Permit Authorizing Individual’s (PAI) certification may be revoked if the PAI has failed to issue permits on days when hot work is performed, or if unsafe practices or conditions are observed.
F. Questions concerning these requirements may be directed to Installation Fire Department.
G. The Contractor shall notify the Fire Department Fire Protection Office a minimum of 48 hours before, and again immediately prior to, temporarily closing any street or paved building access, interrupting water service to any fire hydrant or interrupting the operation of any fire detection, alarm or suppression system. The Fire Department shall be immediately notified upon reopening closed areas, restoration of water service to any fire hydrant, or reactivation of any detection, alarm or suppression system. This notification requirement is in addition to other contract requirements.
H. Provide a 10 lb-capacity, ABC fire extinguisher at all work areas.
I. Report a Fire: Dial 911.

1.06 USE OF LASERS
A. Submit a written request for approval at least 30 calendar days before commencement of activities which require the use of a laser.
B. Submit request to the Installation's Radiation Safety Officer (RSO) with a courtesy copy to the Contracting Officer. Request shall include:

1. Description/Characteristics:
   a. Manufacturer.
   b. Model.
   c. Number of same units.
   d. Serial number(s).
   e. Laser medium.
   f. Mode of operation (i.e. continuous wave (CW), single pulse, multiple pulse).
   g. Maximum exposure time (train length).
   h. Ime (sec) & wave length.
   i. Energy/pulse (J) or CW power (W).
   j. Pulse repetition frequency.
   k. Pulse width.
   l. Beam diameter (at 1/e point).
   m. Beam divergence (at 1/e point).

2. The part of the EXCHANGE contract describing work to be done and the inclusive dates of such work.

3. An acknowledgment that the RSO may make initial and periodic checks to ensure the Contractor is following applicable radiological health and safety practices which prevent unnecessary exposures to Installation personnel.

1.07 OZONE DEPLETING SUBSTANCES
   A. No ozone depleting substances (refrigerants or any other compounds) shall be used in any capacity on this project unless specifically approved by the HazMat.

1.08 LEAD BASE PAINT
   A. No paint with a lead content of 0.06 percent or greater shall be used in any capacity on this project unless specifically approved by the HazMat.

1.09 CLEANING AND DEBRIS CONTROL
   A. During the term of this Contract, the Contractor shall remove any materials and equipment that are not required for the completion of the work as promptly as possible. All debris shall be removed from the site and legally disposed of. The Contractor shall take particular care to eliminate any hazards created by these operations.

   B. The Contractor is responsible for any damage caused by the debris without additional cost to the Government.

   C. The Contractor shall maintain at all times during the work at this Project Site a strict windblown debris control program. This program shall ensure no windblown debris or other debris from the work shall contaminate or interfere with any access to or operation of any facility or any parking area, road or street.

1.10 NUISANCE DUMPING AND POLLUTING ACTIVITIES
   A. Polluting, dumping, or discharging of any harmful, nuisance, or regulated materials (such as concrete truck washout, vehicle maintenance fluids, residue from saw cutting operations, solid waste or hazardous substances) into building drains, site drains, streams, waterways, holding ponds or to the ground surface is not permitted. The Contractor shall be responsible for any and all damages resulting from dumping or discharges. Further, the Contractor shall conduct activities in such a fashion to avoid creating any legal nuisance, including but not limited to, suppression of noise and dust, control of erosion, and implementation of other measures as necessary to minimize off site impacts of work activities.

   B. Fugitive Dust emissions (airborne dust generated by vehicles operating on unpaved surfaces, transfer or transport of dust producing materials, etc.) shall be controlled at the construction site, along haul routes and at staging areas. Water spraying shall be conducted as necessary to minimize fugitive dust generation.
1.11 SUSPECTED HAZARDOUS MATERIALS
   A. Any suspect hazardous materials encountered during demolition or construction shall immediately be brought to the attention of the Contracting Officer’s representative. Work shall not resume until the Contracting Officer is satisfied that the materials are not hazardous. Should they be found to be hazardous, the Contractor shall immediately take steps to contain the material, so further damage and contamination does not occur. The Contractor shall then submit a proposal for removal.

1.12 OIL-FILLED OR IMPREGNATED ELECTRICAL COMPONENTS
   A. Notify Installation Environmental Safety Office before demolition or installation of any oil-filled electrical equipment (for example: transformers and regulators). All transformers (both PCB and non-PCB-containing) and light ballasts (unless labeled "No PCBs") shall be disposed through the Installation’s Hazardous Material and Waste Handling facility.

1.13 SPILL RESPONSE AND REPORTING
   A. Spills of hazardous waste, hazardous materials or non-regulated substances such as oils, antifreeze, grease, latex paint, hydraulic fluid, etc. shall immediately be reported to local, state and federal agencies and proper clean-up action. Also, report all spills to the Installation Fire Department by calling 911 at any time, 24/7.
   B. The Contractor is encouraged to have a supply of absorbent pads on-site to aid in immediate clean-up of smaller spills, such as oil, coolant or hydraulic fluid leaks from vehicles or equipment.
   C. Spill notification placards are to be placed on the job site. Installation DPW will provide format and required locations prior to construction.
   D. The Contractor shall develop a spill plan. The format for the plan will be provided by Installation DPW prior to construction.

1.14 WASTE DISPOSAL AND ENVIRONMENTAL PROTECTION
   A. The Contractor shall comply, and ensure that all subcontractors comply, with all Federal, State, local laws, and regulations, ordinances and standards related to environmental pollution control and abatement in effect and the specific requirements stated elsewhere in the Contract Documents.
   B. All hazardous wastes as defined in 40 CFR, Part 261, shall be collected and disposed of in accordance with 40 CFR, Parts 260-268. The Contractor is responsible for properly storing, marking, labeling, securing and transporting hazardous wastes. All hazardous wastes shall be collected in Contractor-furnished DOT/UN approved containers and taken to the Installation Hazardous Waste Facility for disposal. Call the Hazardous Waste Facility prior to transporting wastes to the facility to coordinate delivery of the waste materials. The Contractor shall not store hazardous waste on base for more than 30 days.
   C. Any previously unidentified suspected hazardous materials encountered during performance of the work of the contract shall immediately be brought to the attention of the Contracting Officer.
   D. All general construction wastes, other than those specifically allowed, or required, to be disposed of on-base shall be legally disposed at an off-post sanitary landfill.
   E. Comply with the requirements of the Installation's Hazardous Waste Management Plan (HWMP).

PART 2 - PRODUCTS - (NOT USED)
PART 3 - EXECUTION - (NOT USED)

END OF SECTION
The Contractor shall obtain all permits required by federal, state and local laws for the construction activities involved. The Contractor shall perform all work in such a manner as to minimize the polluting of air, water or land and shall, within reasonable limits, control noise and the disposal of solid waste materials, as well as other pollutants. The Contractor shall ensure that all construction, repair, maintenance operations and practices and waste disposal performed under this contract shall be in strict compliance with all applicable city, county, state and federal environmental laws and regulations.

1. Hazardous and Non-hazardous Waste Disposal: There are no known existing sources of hazardous waste involved with this project. If the Contractor generates or discovers suspected hazardous waste it shall be brought to the immediate attention of the Contracting Officer for review and direction on how to proceed with handling and disposal. As part of the proposed implementation above and prior to on-site construction, the Contractor shall submit for approval, a plan for storing, characterizing and disposing of hazardous and non-hazardous waste materials resulting from the work under this contract. Waste includes, but is not limited to, paint waste, paint equipment cleaners and used paint containers. If any waste material is dumped in unauthorized areas, the Contractor shall remove the materials and restore the area to the condition of the adjacent undisturbed areas. Where directed and approved by the Contracting Officer, contaminated ground shall be excavated, characterized, stored, disposed of and replaced with suitable fill material at the expense of the Contractor. All waste disposal shall be in strict accordance with local, state and federal requirements and regulations. Waste paint, paint equipment cleaners and used paint containers shall be disposed of off base by the Contractor, at the Contractors’ expense. Any soil contaminated through spillage shall be removed and disposed of in accordance with the requirements specified herein. Soil that is required to be removed shall be replaced by similar soil approved by the Contracting Officer.
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Format.
   B. Content.
   C. Revisions to schedules.
   D. Submittals.

1.02 RELATED SECTIONS
   A. Exhibit A - General Conditions of the EXCHANGE Contract for Construction, Article entitled: Schedule and Progress.
   B. Section 01 10 00 - Summary of the Work.
   C. Section 01 31 00 - Project Management and Coordination.
   D. Section 01 32 00 - Construction Progress Documentation.

1.03 GENERAL
   A. The construction phasing shall serve as a guide in managing the construction progress.
   B. In preparing the Construction Progress Schedule, the scheduling of construction shall be the responsibility of the Contractor.

1.04 COORDINATION
   A. Construction shall be phased and coordinated with the Contracting Officer in order to keep to a minimum, any disruption of, or interference with, the operation of the existing retail facility. The Contractor shall notify the Contracting Officer, within 15 days of notice to proceed, if any problems concerning specified construction phasing occur. The EXCHANGE will be in operation, throughout the duration of this contract. Contractor shall submit, in accordance with Section 01 32 00 - Construction Progress Documentation, a detailed schedule of work utilizing the priority and sequence of work shown on the Construction Phasing Plan.
      1. In instances where the EXCHANGE must vacate an area prior to the Contractor initiating work, sufficient time for the EXCHANGE to move fixtures and merchandise as necessary shall be identified in the Contractor's prepared Construction Progress Schedule.
   B. Schedule: The phasing as shown on the drawings is the required sequence. The Contractor must submit suggested revisions to the schedule, for review, to the Contracting Officer within 15 days after execution of a contract. Items specified herein are complementary to work items shown on the drawings schedule.
   C. Beneficial occupancy inspection (finishes only) will be made at the end of each work item, to allow early access for fixture installations.
   D. Phasing: All phases shall be included in the contract performance period.

1.05 BARRIERS:
   A. Building areas adjacent to areas to be renovated will not be vacated by the EXCHANGE; therefore, barriers shall be erected by the Contractor as work progresses. Provide barriers as specified in the locations indicated, and as required, from floor to ceiling or from floor to underside of roof deck, to seal operational portions of the retail facility from areas of construction. Security walls, however, shall be secured up to the bottom of roof deck. Temporary barriers exposed to customer view shall be painted with two coats of color as approved by the Contracting Officer.
1. Dust Barriers: Where dust barriers are required, provide a temporary framework floor to ceiling, adequately braced, 2" x 4" wood studs or metal studs covered with 6 mil fireproof clear polyethylene fiberglass reinforced film as manufactured by Griffolyn, or equal. Tape all joints, and anchor framework as required for maximum stability.

2. Security Weathertight Barriers: Where security weathertight barriers are required, provide a temporary framework adequately braced metal studs with 1/2" plywood on the exterior side and 1/2" gypsum board or plywood on the interior, attached with screws, not nailed.

3. Doors in Barriers: Provide doors in barriers for the Contractor's access to the work, of similar construction to the barrier in which it occurs. Gates shall be hinged, braced, and provided with types of locks in accordance with EXCHANGE security. These shall be double high security padlocks.

4. Rope Barriers: Provide temporary barriers consisting of rope, saw horses, and color flags to control areas as required.

1.06 MATERIALS:

A. All isolation valves and temporary ductwork used to keep system on line in occupied phases for mechanical systems (air-handling units, supply piping, water lines, sprinklers, and other similar items) shall be included by the Contractor at no additional cost to the EXCHANGE.

1.07 GENERAL NOTES:

A. Site Work:
   1. Site work is to be completed as shown on the drawings. Access to the main store must be maintained during the site work construction period. The Contractor must submit his phasing plan for approval by the Contracting Officer.

B. Architectural Systems:
   1. Erect barriers as shown:
      a. Protective barriers for access to retail sales area.
      b. Interior barriers.
      c. Begin demolition work.

C. Air Conditioning and Heating System:
   1. Install required valves and piping at connection points. Shut down of the air conditioning or heating system to install valves and duct changes, and cut off shall be accomplished at a time of low air conditioning or heating requirements in the EXCHANGE, and be of minimum duration. Proposed shutdowns of air conditioning or heating system shall be coordinated with the EXCHANGE. Install control air compressor at mechanical equipment room, if required.
   2. Provide security grilles for existing penetrations through existing roof and walls of retail sales. These security grilles will be temporary until new ducts are installed.
   3. Connect new control air lines to existing control air (for pneumatic control for pneumatic thermostats).
   4. Install new air handling units, piping, grilles, diffusers, variable air volumes units and electric cabinet heaters as construction progresses.

D. Electrical Systems:
   1. Rework electrical systems to allow for continual service to retail area.
   2. Install electrical distribution and telephone to existing construction.
   3. All of the above work shall be completed without disruption of store operation during normal business working hours.

E. Plumbing System:
   1. Install all required piping and valves at the connection points. Shutdown of the plumbing systems to make necessary connections and extensions shall be accomplished at a time so as not to interfere with operation of the EXCHANGE, and shall be of minimum duration. All proposed shutdowns of the plumbing systems shall be coordinated with the EXCHANGE.

F. Sprinkler Systems:
1. Modify existing sprinklers as required. Work shall be coordinated with EXCHANGE and fire department personnel.

G. Electrical Security Systems:
   1. Temporarily modify the alarm system to allow access during working hours to the temporary entrances.

PART 2 - PRODUCTS (NOT USED)
PART 3 - EXECUTION (NOT USED)

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Requirements and limitations for cutting and patching of Work.

1.02 RELATED SECTIONS
   A. Section 01 10 00 - Summary.
   B. Section 01 33 00 - Submittals.
   C. Section 02 41 16 - Selective Demolition.
   D. Section 07 01 50 - Maintenance of Membrane Roofing.
   E. Individual Product Specification Sections:
      1. Cutting and patching incidental to work of the section.
      2. Advance notification to other sections of openings required in work of those sections.
      3. Limitations on cutting structural members.

1.03 SUBMITTALS
   A. Submit written request in advance of cutting or alteration which affects:
      1. Structural integrity of any element of Project.
      2. Integrity of weather exposed or moisture resistant element.
      3. Efficiency, maintenance, or safety of any operational element.
      5. Work of EXCHANGE or separate contractor.
   B. Include in request:
      1. Identification of Project.
      2. Location and description of affected Work.
      3. Necessity for cutting or alteration.
      4. Description of proposed Work and Products to be used.
      5. Alternatives to cutting and patching.
      6. Effect on work of EXCHANGE or separate contractor.
      7. Written permission of affected separate contractor.
      8. Date and time work will be executed.

PART 2 – PRODUCTS

2.01 MATERIALS
   A. Primary Products: Those required for original installation.

PART 3 – EXECUTION

3.01 EXAMINATION
   A. Examine existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
   B. After uncovering existing Work, assess conditions affecting performance of work.
   C. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION
   A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.
   B. Provide protection from elements for areas which may be exposed by uncovering work.

3.03 CUTTING
   A. Execute cutting and fitting to complete the Work.
   B. Uncover work to install improperly sequenced work.
C. Remove and replace defective or non-conforming work.
D. Remove samples of installed work for testing when requested.
E. Provide openings in the Work for penetration of mechanical and electrical work.
F. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

3.04 PATCHING
A. Execute patching to complement adjacent Work.
B. Fit Products together to integrate with other Work.
C. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
D. Employ original installer to perform patching for weather exposed and moisture resistant elements, and sight-exposed surfaces.
E. Restore work with new Products in accordance with requirements of Contract Documents.
F. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
G. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
H. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

END OF SECTION
SECTION 01 21 00
ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Quantity allowances.
B. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 22 00 - Unit Prices.
B. Section 01 31 00 - Project Management and Coordination: Project communication system for team collaboration during construction.
C. Section 03 30 00 - Cast-in-Place Concrete.
D. Section 03 35 36 - Polished Concrete Floor Finish.
E. Section 03 35 40 - Interior Concrete Slab Repairs and Joint Filler Replacement.

1.03 QUANTITY ALLOWANCE

A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Quantity Allowance.
B. Contracting Officer's Representative Responsibilities:
   1. Oversee monitoring of quantities by a qualified surveyor.
   2. Obtain written verification of quantities from a qualified surveyor.
   3. Prepare Change Order.
C. Contractor Responsibilities:
   1. Cooperate with Owner's consultant engaged to monitor quantities.
      a. Note: All quantities must be verified in writing by the Owner's surveyor prior to approval by the Contracting Officer's Representative.
   2. Review survey results and submit claim for Change Order.
D. Differences between bid allowance and actual quantities will be adjusted by Change Order in accordance with Unit Prices as described in Section 01 22 00 - Unit Prices.

1.04 ALLOWANCES SCHEDULE

A. Quantity Allowance for Floor Outlet Repairs: 150 Floor Outlets.
   1. Contractor's Base Bid shall include an allowance for the cost of removing 150 existing floor outlets and filling-in the holes as required by Section 03 35 40, in preparation for polishing the floor as specified in Section 03 35 36.
      a. At the end of the project, any unused portion of the allowance shall be credited to the Owner at the Unit Price rate established in the Contractor's Proposal.
      b. If the quantity allowance is insufficient to cover the quantity encountered of existing floor outlets to be removed, the Contract Sum will be adjusted by Change Order in accordance with Unit Price rate established in the Contractor's Proposal.
B. Quantity Allowance for Replacement of Existing Concrete (Interior) Floor Slabs: 500 SF.
   1. Contractor's Base Bid shall include an allowance for the cost of removing and replacing 500 SF of concrete (interior) floor slab as specified in Section 03 30 00.
      a. At the end of the project, any unused portion of the allowance shall be credited to the Owner at the Unit Price rate established in the Contractor's Proposal.
      b. If the quantity allowance is insufficient to cover the amount of slab replacement required, the Contract Sum will be adjusted by Change Order in accordance with Unit Price rate established in the Contractor's Proposal.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 22 00
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Administrative and procedural requirements for unit prices.

1.02 RELATED REQUIREMENTS
A. Section 03 35 40 - Interior Concrete Slab Repairs and Joint Filler Replacement: Worksheet to be filled out and included with Proposer's Bid.

1.03 DEFINITIONS
A. Unit price shall be added to Contractor's proposal on EXCHANGE Solicitation Form 4450-024, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if concealed conditions cause quantities of Work required by the Contract Documents to be increased or decreased.

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

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SCHEDULE OF UNIT PRICES
A. Item No. 1: Interior Concrete Slab Enhancement, Repair and Joint Filler Replacement:
   1. Description: Provide interior concrete slab enhancement, repair and joint filler replacement in accordance with Section 03 35 40.
   2. Submit the Unit Prices listed on the Worksheet attached to Section 03 35 40. Total cost of Unit Prices shall be included in Base Bid Proposal. Worksheet shall be attached to the Proposer's Bid.

END OF SECTION
SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 REQUESTS FOR INFORMATION (RFIS)
   A. RFI Forms: Software-generated form acceptable to Architect and EXCHANGE Project Manager.
   B. Architect's Action: Allow seven working days for Architect's response for each RFI.
   C. RFI Log: Maintain a tabular log of RFIs. Submit log weekly.

1.02 PROJECT WEB SITE
   A. Use EXCHANGE’s Project Web site for project communication and documentation.
   B. EXCHANGE to provide up to seven Project Web site user licenses for use of EXCHANGE's Commissioning Authority, Contractor, Architect, and Architect's consultants. EXCHANGE to provide eight hours of software training at Architect's office for Project Web site users.
   C. Project Web site software package:
      1. Autodesk, Constructware.

1.03 PRECONSTRUCTION MEETING
   A. The Contracting Officer and/or Contracting Officer’s representative will schedule and preside at preconstruction meeting.
   B. Attendance Required:
      1. Contracting Officers and/or Contracting Officer’s representative and other Headquarters EXCHANGE representatives.
      2. Local and regional EXCHANGE representatives.
      3. Installation representative (Engineering, Fire Marshall, Security, etc.).
      4. Contractor.
      5. Major Sub-contractors.
   C. Agenda:
      1. Execution of Notice to Proceed.
      3. Submission of list of sub-contractors.
      4. Review of EXCHANGE checklist of contract requirements.
      5. Discussion of Schedule.
      6. Discussion of critical sequencing.
      7. Designation of responsible personnel.
      8. Processing of field decisions and change orders.
      9. Submission of applications for payment.
     10. Submittal of shop drawings.
     11. Procedures for maintaining record documents.
     12. Fire and safety procedures.
     15. Housekeeping procedures.
     16. Use of premises
        a. Office and storage locations.
        b. Personnel parking.
        c. Major equipment deliveries.
        d. Other issues pertinent to completing the contract.
   D. Meeting minutes: Minutes will be taken by the A/E and distributed to EXCHANGE, Contractor, and Installation Engineer.
1.04 PROGRESS MEETINGS

A. The contractor shall schedule and preside at monthly progress meetings.

B. The contractor shall make arrangements for meetings, prepare agenda with copies for participants.

C. Location of Meetings: Construction office, or as directed in the notice.

D. Attendance Required:
   1. Contractor's project manager.
   2. Contractor's superintendent.
   3. Major sub-contractors and suppliers.
   4. EXCHANGE representative (EXCHANGE's option).

E. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems and decisions.
   4. Identification of problems which impede planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Coordination of projected progress.
   10. Maintenance of quality and work standards.
   11. Effect of proposed changes on progress schedule and coordination.
   12. Other business relating to work.

F. Meeting Minutes: A/E shall record meeting minutes, and distribute copies to the participants (including the EXCHANGE Contracting Officer, within three (3) business days of the meeting.

1.05 PROJECT MEETINGS

A. The Contractor shall schedule and preside at other project meetings when required.

B. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
   1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and EXCHANGE’s Commissioning Authority of scheduled meeting dates.
   2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
      b. Options.
      c. Related RFIs.
      d. Related Change Orders.
      e. Purchases.
      f. Deliveries.
      g. Submittals.
      h. Review of mockups.
      i. Possible conflicts.
      j. Compatibility requirements.
      k. Time schedules.
      l. Weather limitations.
      m. Manufacturer's written instructions.
      n. Warranty requirements.
      o. Compatibility of materials.
      p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access limitations.
s. Regulations of authorities having jurisdiction.
t. Testing and inspecting requirements.
u. Installation procedures.
v. Coordination with other work.
w. Required performance results.
x. Protection of adjacent work.
y. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

C. Coordination Meetings: At weekly intervals, in addition to specific meetings held for other purposes.

PART 2 - PRODUCTS (NOT USED)
PART 3 - EXECUTION (NOT USED)

END OF SECTION
SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Format.
B. Content.
C. Revisions to schedules.
D. Submittals.
E. Progress photographs.

1.02 RELATED SECTIONS

A. General Provisions of the EXCHANGE Contract for Construction, Article entitled: "Schedule and Progress."
B. Section 01 10 00 - Summary.
C. Section 01 33 00 - Submittals.

1.03 GENERAL

A. The Contractor-prepared progress chart shall serve as a guide in managing the construction progress.
B. In preparing this system, the scheduling of construction shall be the responsibility of the Contractor.
C. The schedules shall be prepared using the Critical Path Method (CPM).

1.04 FORMAT

A. Prepare schedules as a horizontal bar chart with separate bar for each major portion of work or operation, identifying first workday of each week.
B. The format shall be such to enable the Contracting Officer to evaluate the reasonableness of the proposed schedule and to determine if the actual construction is on schedule.

1.05 CONTENT

A. Show complete sequence of construction by activity with dates for beginning and completion of each element of construction.
B. Identify each item by specification section number.
C. Show accumulated percentage of completion of each item and total percentage of Work completed as of the first day of each month.
D. Indicate delivery dates for EXCHANGE furnished products.

1.06 REVISIONS TO SCHEDULES

A. Indicate progress of each activity to date of submittal and projected completion date of each activity.
B. Identify activities modified since previous submittal, major changes in scope and other identifiable changes which could affect the schedule.
C. Provide narrative report with each submittal describing work accomplished during the previous period, the work scheduled for the next period, anticipated problem areas and delays and impact on the schedule. Report corrective action taken or proposed.

1.07 SUBMITTALS

A. Submit a preliminary schedule through the Contracting Officer defining the Contractor's proposed operations for the first sixty (60) of the contract within ten (10) days after date of Notice to Proceed. Indicate the Contractor's general approach for the balance of the project.
Include the cost of the activities expected to be completed or partially completed before submission and approval of the complete progress schedule.

B. Upon approval of the preliminary schedule by the Contracting Officer and within thirty (30) calendar days after the Notice to Proceed, the Contractor shall submit the complete Progress Schedule.

C. Submit revised Progress Schedules with each monthly Application for Payment.

D. Submit the number of opaque reproductions which Contractor requires plus four (4) copies which will be retained by Contracting Officer.

1.08 DISTRIBUTION

A. Distribute copies of reviewed schedules to project site file, subcontractors, suppliers and other concerned parties.

B. Instruct recipients to promptly report in writing, problems anticipated by projections indicated in schedules.

1.09 PROGRESS PHOTOGRAPHS

A. Submit new photographs at least once a month, within 3 days after exposure.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of Work produced by an experienced photographer, acceptable to Contracting Officer's Representative.

D. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Existing building exteriors and interiors, prior to beginning work, as evidence of existing project conditions.
   2. New exterior construction, in progress and upon completion.
   3. New interior construction, in progress and upon completion.
   4. Final completion, minimum of ten (10) photos.

E. Views:
   1. Consult with Contracting Officer's Representative for instructions on views required.
   2. Provide factual presentation.
   3. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
   4. Point of View Sketch: Provide sketch identifying point of view of each photograph.

F. Digital Photographs: 24 bit color, minimum resolution of 1600 by 1200 ("2 megapixel"), in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email, and with separate project record photo CD.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. Point of View Sketch: Include digital copy of point of view sketch with each electronic submittal; include point of view identification in each photo file name.
   4. PDF File: Assemble all JPG photos into printable pages in PDF format, with 1 photo per page, each photo labeled with file name; one PDF file per submittal.
   5. Photo CD(s): Provide 2 copies including all photos cumulative to date and PDF file(s), with files organized in separate folders by submittal date.
      a. Provide 1 Photo CD each to Contracting Officer's Representative and Architect on a monthly basis.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION
SECTION 01 33 00
SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Submittal procedures.
B. Construction progress schedules.
C. Shop Drawings.
D. Samples.
E. Product Data.
F. Certificates.

1.02 RELATED SECTIONS
A. Section 01 10 00 - Summary.
B. Section 01 32 00 - Construction Progress Documentation.
C. Section 01 78 39 - Project Record Documents.

1.03 SUBMITTAL PROCEDURES
A. Transmit each submittal with EXCHANGE Form 4450-48, Shop Drawings and Material Approval Submittal.
B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
C. Identify Project, Contractor, subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.
D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
E. Schedule submittals to expedite the Project. Transmit submittals to Contracting Officer. Coordinate submission of related items.
F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work. Failure to identify such variations will not relieve the Contractor of the responsibility for completing the work in full accordance with the Contract Documents even though such submittals are approved by the Contracting Officer.
G. Prior to approval of the material/product submitted, the contractor shall include with the submittal a written certification that the material/product contains no asbestos. This certificate is mandatory before approval will be issued.
H. Provide space for Contractor and Contracting Officer review stamps.
I. When revised for resubmission, identify all changes made since previous submission.
J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

1.04 CONSTRUCTION PROGRESS SCHEDULES
A. Submit preliminary Progress Schedule within ten (10) days of the Notice to Proceed.
B. Submit complete (final) Progress Schedule within thirty (30) days of the Notice to Proceed.
C. Submit monthly revisions of Progress Schedule.
D. Refer to Section 01 32 00 - Construction Progress Documentation, for submittal information.

1.05 SHOP DRAWINGS
A. Shop Drawings For Review:
1. Submitted to Contracting Officer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
2. Shop drawings shall be prepared by a qualified detailer.
3. Minimum sheet size for shop drawings shall be 8 1/2" x 11".
4. After review, and distribute copies in accordance with Submittal Procedures article above and for record documents purposes described in Section 01 77 00 - Project Closeout.

B.
Shop Drawings For Project Close-out:
1. Submitted for the EXCHANGE’s benefit during and after project completion.

C.
Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
1. Submit the number of opaque reproductions which Contractor requires, plus three (four on structural, mechanical, and electrical submittals) copies which will be retained by Contracting Officer.

1.06 SAMPLES
A.
Samples For Review:
1. Submitted to Contracting Officer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
2. After review, produce duplicates and distribute in accordance with Submittal Procedures article above and for record documents purposes described in Section 01 77 00 - Project Closeout.

B.
Samples For Information:
1. Submitted for the Contracting Officer’s knowledge as project administrator or for EXCHANGE.

C.
Samples For Selection:
1. Submitted to Contracting Officer for aesthetic, color, or finish selection.
2. Submit samples of finishes from the full range of manufacturers’ standard colors, or in custom colors (if so stated in the product specification section), textures, and patterns for Contracting Officer selection.
3. After review, distribute in accordance with Submittal Procedures article above and for record documents purposes described in Section 01 77 00 - Project Closeout.

D. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

E. Include identification on each sample, with full Project information.

F. Submit the number of samples specified in individual specification sections; two of which will be retained by Contracting Officer.

G. Reviewed samples which may be used in the Work are indicated in individual specification sections.

H. Coordinate sample submittals with respective shop drawings.

1.07 PRODUCT DATA
A. Submit Manufacturer’s catalog sheets, brochures, diagrams, schedules, performance charts, specifications, illustrations, and other descriptive data.

B. Product data that relates to shop drawings or samples must be submitted with the respective shop drawings or samples.

1.08 CERTIFICATES
A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Contractor to Contracting Officer, in quantities specified for Product Data.
B. Certify that material or Product conforms to or exceeds specified requirements. Submit supporting reference data, test results, affidavits, and/or certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect/Engineer.

1.09 LIMITATIONS AND CONTRACTOR’S RESPONSIBILITIES

A. Submittals will be reviewed for the limited purpose of checking for conformance with the design concept and the information shown in the drawing and specifications. These reviews shall not include review of the accuracy for completeness of details. A review shall not indicate that the reviewer has checked the entire system of which the reviewed item is a component. The reviewer shall not be required to review partial submissions.

PART 2 PRODUCTS (NOT USED)
PART 3 EXECUTION (NOT USED)

END OF SECTION
Section 01 33 10
Weather Table

Part 1 - General

1.01 Weather Table
A. Information and data furnished or referred to in the weather table is furnished for the Contractor's information.

1.02 Contract Time Limit
A. The Contract time limits include weather conditions that are shown in the weather table listed below.

1.03 Time Extensions for Unusually Severe Weather
A. This provision specifies the procedure for determination of time extensions for unusually severe weather affecting exterior work in accordance with the Contract. The following listing defines the monthly anticipated adverse weather days for the contract period and is based on NOAA data for the geographic location of the project.

<table>
<thead>
<tr>
<th>MONTHLY ANTICIPATED ADVERSE WEATHER CALENDAR DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HURLBURT FIELD, FLORIDA</td>
</tr>
<tr>
<td>JAN   FEB   MAR   APR   MAY   JUN   JUL   AUG   SEP   OCT   NOV   DEC</td>
</tr>
<tr>
<td>4     3      4      3      3      5      6      5      4      3      3      4</td>
</tr>
</tbody>
</table>

1. The listing of anticipated adverse weather will constitute the base line for monthly weather time evaluations.
2. Throughout the Contract, each month actual adverse weather days will be recorded on a calendar basis (including weekends and holidays) and compared to the monthly anticipated adverse weather in this listing.
3. The term "actual adverse weather days" shall include days impacted by actual adverse weather.
4. The number of actual adverse weather days affecting exterior work shall be calculated chronologically from the first to the last day in each month.
5. Adverse weather days must prevent work for 50 percent or more of the Contractor's work day and delay work critical to the timely completion of the project.
6. If the number of actual adverse weather days exceeds the number of days anticipated in the above listing, the Contractor may submit in writing to the Contracting Officer a request for a time extension within 30 days of the adverse weather. If not submitted in the 30 day period, the request will not be considered.
7. Based upon the above listing, the Contracting Officer will determine if the time extension for the Contractor is warranted.
8. The Contracting Officer will then convert any qualifying delays to calendar days and issue a modification in accordance with contract.
9. Any Time extensions granted under this provision will be at no cost to EXCHANGE.

Part 2 Products – Not Used
Part 3 Execution – Not Used

End of Section
SECTION 01 35 43  
ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 DESCRIPTION

A. The work covered by this section consists of furnishing all labor materials, and equipment and performing all work required for the prevention of environmental degradation during and as a result of construction operations under this contract. These requirements are in addition to any environmental protection requirements elsewhere in these specifications. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents, not naturally occurring at the site, which adversely affect human health or welfare; unfavorably alter ecological balances important to human life; affect other species of importance to humans; or degrade the utility of the environment for aesthetic and recreational purposes. The control of environmental pollution by the Contractor requires consideration of air, water, and land, and involves noise control, solid waste management and management of radiant energy and radioactive materials, as well as other pollutants. This section also requires the protection of cultural and historic resources.

B. Contractor shall coordinate the work of this section with the work called for under the various Earthwork and Utilities Sections.

1.02 CONTRACTOR'S GENERAL ENVIRONMENTAL COMPLIANCE OBLIGATIONS

A. Work under this contract is to be performed on a government facility. All environmental rules applying to contractor operations elsewhere will also apply on the government facility. Contractor (and any subcontractor, agent or representative) shall comply with all Applicable Federal, State, and local laws and regulations providing for environmental protection and pollution control and abatement. These include but are not limited to: the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act, Toxic Substances Control Act, Federal Insecticide Fungicide and Rodenticide Act, Coastal Zone Management Act, Endangered Species Act, National Historic Preservation Act, Safe Drinking Water Act, Emergency Planning and Community Right-to-Know Act, Oil Pollution Act, Archaeological Resources Protection Act, and Pollution Prevention Act. Contractor has the duty to determine for itself where such laws and regulations apply. Although the Contractor may request assistance from the Contracting Officer in delineating applicable environmental laws and regulations. Contractor has an independent responsibility to make its own determination and to do so in a timely fashion.

1.03 FINES OR PENALTIES FOR ENVIRONMENTAL NON-COMPLIANCE

A. The Contractor shall be responsible for paying any fines or penalties assessed against EXCHANGE or the Installation or the Army or the Air Force for violations of environmental laws or regulations resulting from acts or omissions of the Contractor or its employees, subcontractors, or agents. This obligation is in addition to any fines or penalties that may be assessed against the Contractor for the same conduct. Contractor may either reimburse these fines or penalties through the Contracting Officer, or with the consent of the Contracting Officer, the Contractor may pay such fines or penalties directly to the regulatory agency or agencies concerned.

1.04 CONTRACTOR'S LIABILITY FOR ENVIRONMENTAL DAMAGES

A. Contractor agrees to hold harmless and indemnify EXCHANGE (which includes the Army, Air Force, or other Department of Defense component, as appropriate) for any and all damages of any kind resulting from environmentally harmful activities by the Contractor, Contractor's employees or agents of subcontractors. "Damages" includes but is not limited to personal injury, property damages (including diminution of value), or death, environmental restoration and response costs, natural resource damages, expert witness and attorney's fees, and reimbursement or any and all expenses incurred to obtain permits as a result of Contractor’s failure to identify or obtain permits for itself or AAFES.
1.05 CONTACT WITH ENVIRONMENTAL REGULATORY OFFICIALS
A. Contractor shall immediately advise the Contracting Officer and the installation environmental office of the content of all contacts with federal, state, or local environmental regulators, before, during, and after the performance of this contract concerning the performance of this contract.

1.06 PERMITS FOR EQUIPMENT USED BY CONTRACTOR IN PERFORMING EXCHANGE CONTRACTS.
A. For equipment used in the performance of this contract, Contractor shall obtain in Contractor’s name and at no additional expense to EXCHANGE, all permits, coordination’s, certifications other regulatory authorization necessary to perform and complete the work required by this contract under applicable environmental laws and regulations. “Applicable environmental laws and regulations” includes but is not limited to: the Clean Air Act, Clean Water Act, Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA), Toxic Substances Control Act, Federal Insecticide Fungicide and Rodenticide Act, Coastal Zone Management Act, Endangered Species Act, National Historic preservation Act, Safe Drinking Water Act, Emergency Planning and Community Right-to-Know Act, Oil Pollution Act, and Pollution Prevention Act and State, County, and Local laws and regulations on the same subjects.

1.07 PERMITS NEEDED FOR CONSTRUCTION, EXCAVATION, MODIFICATION, RENOVATION, DEMOLITION, INSTALLATION, OR OTHER ALTERATION OF BUILDINGS, STRUCTURES, EQUIPMENT, INSTALLATIONS, REAL PROPERTY OR SYSTEMS
A. Contractor shall identify all Federal, State, County, or local permits, coordination, certifications or other regulatory authorization requirements under all applicable environmental laws and regulations as defined in (a) above. Contractor shall then prepare and submit in draft all applicable permit applications, coordinations, notices, or other required fillings, together with all supporting data to the Contracting Officer for review. Permit applications or notifications or other documents that must be submitted by EXCHANGE will be submitted by EXCHANGE, and any documents that must be submitted by the Contractor will be returned after review to the Contractor for submission. No work requiring permit or other written authorization shall proceed before the Contractor has the permit or authorization or a copy thereof in its possession.

PART 2 - MATERIALS
2.01 RECYCLED MATERIALS
A. Materials used in this contract shall be to the greatest extent practicable and consistent with financial prudence, made of recycled materials or of materials that are recyclable. Where construction debris such as concrete or asphalt or wood can be recycled, this alternative will be considered.

2.02 ASBESTOS
A. Asbestos will not be used or included in this project.

2.03 POLYCHLORINATED BIPHENYLS (PCBS)
A. PCBs will not be used or included in this project.

2.04 LEAD-BASED PAINT
A. Lead-based paint will not be used or included in this project.

2.05 OZONE-DEPLETING SUBSTANCES
A. “Class I substance,” as used in this clause, means any substance designated as class I by the Environmental Protection Agency (EPA)(40 CFR Part 82), including but not limited to chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform.

B. “Class II substance,” as used in this clause, means any substance designated as class II by EPA (40 CFR Part 82), including but not limited to, hydrochlorofluorocarbons.

C. As required by 42 USC 7671 (b), (c), and (d) and 40 CFR Part 82, Subpart E, the Contractor shall label products which contain class I or class II ozone-depleting substances or are
manufactured with a process that uses class I or class II ozone-depleting substances, or containers of class I or class II ozone-depleting substances as follows:

WARNING: Contains (or manufactured with, if applicable) ____________________,*
(a) substance(s) which harm(s) public health and the environment by destroying ozone in the upper atmosphere.

* The Contractor shall insert the name of the substance(s).

D. The Contractor shall comply with the applicable requirements of Sections 608 and 609 of the Clean Air Act (42 USC 7671g, National Recycling and Emission Reduction Program and 7671h, Servicing of Motor Vehicle Air Conditioners) as each or both apply to the contract.

2.06 PESTICIDES

A. Except as may be specified elsewhere in this contract, Contractor will not use or apply pesticides (such as herbicides or weed-killers, insecticides, or rodenticides) without specific written prior approval of the Contracting Officer.

PART 3 EXECUTION (WORK PRACTICES)

3.01 GENERAL: SITE DISTURBANCE DURING CONSTRUCTION ACTIVITIES

A. Contractor shall use industry-recognized best management practices to avoid creation of fugitive dust emissions and to avoid and control storm water runoff from the construction site and any temporary roads that may be used for access to it. Water sprinkling may be used to control dust. Contractor shall perform all work under this contract in such a manner that no pollutants of any kind are released into ditches, storm drains, streams, lakes, or other surface waters on or connected to the site.

3.02 PROTECTION OF WATER RESOURCES

A. General: The General Contractor shall not pollute storm drainage, streams, lakes, or reservoirs with fuels, oils, bitumens, calcium chloride, acids, construction wastes, or other harmful materials or pollutants. It is the responsibility of the General Contractor to determine and comply with all applicable federal, state, regional, municipal, and other regulations.

B. Spillage: The General Contractor shall take special measures to prevent chemical, fuels, oils, greases, bituminous materials, waste washings, herbicides, cement, and surface drainage from entering public waters. In the event of a spill, the Contractor must make all required notifications to federal, state, or local authorities and will notify the Contracting Officer immediately.

C. Washing and Curing Water: Water used in aggregate processing, concrete curing, foundation, and concrete lift clean-up and other waste water shall not be allowed to enter the storm drainage system.

3.03 PROTECTION OF LAND RESOURCES

A. General: It is intended that the land resources within the project boundaries and outside the limits of permanent work performed under this contract be preserved in their present condition or be restored to a condition after completion of construction that will appear to the natural and not detract from the appearance of the project. The General Contractor shall limit his construction activities to areas defined by the Drawings or Specifications.

B. Prevention of Landscape Defacement: Except in areas marked on the plans to be cleared, the General Contractor shall not deface, remove, cut, injure or destroy trees or shrubs without specific written authority. Trees designated to be saved shall be protected from either excavation or filling within the root zone. No ropes, cables, or guys shall be fastened or attached to any existing tree for anchorage unless specifically authorized by the Contracting Officer. The General Contractor shall in any event be responsible for any damage resulting from such use.
C. Restoration of Landscape Damage: Any trees or other landscape features scarred or damaged by the General Contractor’s equipment or operations shall be restored as nearly as possible to the original condition at the General Contractor’s expense. The Contracting Officer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of under requirements for clearing and grubbing. All scars made on trees not designated on the plans to be removed by equipment construction operations, or by the removal of limbs larger than 1-inch in diameter shall be coated immediately with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced landscape personnel. Tree trimming with axes shall not be permitted. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the General Contractor and are beyond saving in the opinion of the Contracting Officer, shall be immediately removed and replaced with a nursery-grown tree of the same species.

3.04 CONTROL OF AIR EMISSIONS

A. Contractor’s actions shall conform to all federal, state, and local requirements for the control of air emissions during work under this contract. Trucks leaving the site will be brushed or washed to remove all practicable amounts of dust or other material that may become airborne. Contractor will ensure that all internal construction vehicles and equipment used will have the lowest practicable emissions characteristics and be maintained in optimum operating condition for the reduction of air emissions. Where use of electric motors instead of internal combustion engines is feasible, electric motors will be used during construction.

3.05 POLLUTION PREVENTION

A. The Contractor should use prior planning to find those materials that will minimize the creation of waste in general and hazardous waste in particular. Recycling should be considered and implemented at every practicable stage of the project.

3.06 WASTE DISPOSAL

A. Pollution Prevention: The Contractor should use prior planning to find those materials and work practices that will minimize the creation of waste in general and hazardous waste in particular.

B. Hazardous Waste Generation, Handling, and Disposal: Work done under this contract is to be performed on a government facility. According to rules and procedures of the United States Environmental Protection Agency, the federal facility is required to have a generator identification number under the Resource Conservation and Recovery Act (RCRA) and to be responsible for wastes (as defined under RCRA) produced, managed, stored, disposed on, or transported from the facility. Accordingly, Contractor will, to the greatest extent practicable, use materials, processes, and techniques that will avoid the creation of hazardous waste. Contractor shall prepare and follow a written waste management and disposal plan for all hazardous wastes generated on the site. Prior to generation of any hazardous wastes, contractor will coordinate planned activities regarding hazardous materials and hazardous waste with the Contracting Officer. Contractor shall submit a written waste management plan, through the Contracting officer, to installation environmental office. Contractor shall follow this plan once it has been approved by the Contracting Officer. Under no circumstances will Contractor bring onto the site hazardous waste that has been generated elsewhere. All hazardous waste will be properly disposed of by the Contractor in accordance with all federal, state, and local requirements.

C. Disposal of Non-RCRA Wastes: All non-hazardous wastes generated on the site as a result of this contract must be disposed of properly, in accordance with all federal, state, and local requirements. Materials will be recycled whenever practicable. Prior to creation of such wastes, the Contractor will submit to the installation environmental management function, through the Contracting Officer, a plan for disposal of wastes. Such plan shall include the types of waste to be created, how they shall be stored, managed and disposed. Contractor shall follow this plan once it has been approved by the installation and Contracting Officer. Such wastes will not be created until approved by the Contracting Officer.

D. Construction Debris:
1. Debris from demolition of existing structures will ordinarily be removed to a location on the Installation, as designated by the installation authorities.

2. If a location on the Installation is not available, other sections in this contract may require the Contractor to remove clean construction debris from the site to a location of the contractor’s choosing off the installation. (Site soil or other site media are not covered by this paragraph.) Debris will be recycled or disposed of in accordance with all applicable federal, state, and local rules. Such debris must be free of all contamination, including but not limited to, lead paint, asbestos, and insecticides. Prior to removal of any construction debris, that debris must be certified by the installation to be free of contamination and of no value to the United States, and this certification must be provided to the Contracting Officer. To expedite work, this may be accomplished by a telex or other suitable electronic means, however, the original certification form must be provided to the Contracting Officer. No form is prescribed for this certification so long as all necessary information is provided and the document is signed by an authorized installation representative. However, an example is provided at the end of this section of the specifications, and this form may be used. All construction debris removed from the installation must be covered by a certification. The Contractor must arrange with installation POC whether all debris will be covered by one certification or it several certifications will be required.

E. Consolidated Waste Disposal Plans: Contractor may, at Contractor’s option submit for approval as specified above one consolidated plan for handling hazardous and non-hazardous wastes.

F. Earthwork and Removal of Potentially Contaminated Media:
   1. Unless otherwise specified elsewhere in this contract, the site has been inspected and is, consistent with best professional judgment, free of environmental contamination or pollution. However, work under this contract will be performed on a military installation, where the history of prior military and industrial activities is not necessarily completely known. The following provisions prohibit the removal from the installation of soil or other materials found on site and are included, in an abundance of caution, for the protection of EXCHANGE, the installation, and the Contractor.
   2. Notwithstanding any another clause in this contract, including but not limited to all standard site work general provisions; no media by-product resulting from site preparation, construction or excavation shall be moved off the post, base, or installation where the construction is occurring. If the construction is off the post, base or installation, no media by-product shall be moved off the construction site.
   3. The Contractor shall: (1) leave the media in place at the site, subject to appropriate erosion control; or (2) haul the media to and place it at a location on the installation that has been designated wither in this contract or in writing by the Contracting Officer; and (3) if unforeseen difficulties arise, such as excessive quantity of media is generated, the Contractor shall advise the Contracting Officer and shall not remove media from the site without written authorization from the Contracting Officer.

3.07 DEFINITIONS
   A. Media – Any soil, water, or air, moved, disturbed or released from a site.
   B. The terms hazardous, waste, pollutant, contaminate, substance have the same means and usage here as they commonly do in the CERCLA, RCRA, FWPCS, CAA, TSCA, and SDWA respectively.

3.08 UNEXPECTED SITE CONDITIONS
   A. CONTAMINATED SOIL OR GROUNDWATER:
      1. Unless otherwise specified elsewhere in this contract, site has been inspected and is, consistent with best professional judgment, free of environmental contamination of pollution. However, unexpected conditions can always arise. Contractor or subcontractor personnel may encounter soil or groundwater that is suspected to be contaminated, either because of odors, colors, free liquids, unexpected construction debris, or other suspicious conditions. Should this occur, Contractor will immediately notify the Contracting Officer
and the installation environmental office and take necessary initial measures to protect workers, the site, and other personnel.

B. UNEXPECTED ARTIFACTS OR RELICS:
   1. Should Contractor employees in the course of site preparation or other work on this contract find unexpected historic or archaeological remains, such as bones, arrow points, pottery remnants, foundations, or other evidence or previous uses of the site, Contractor will cease further site-disturbing activity and immediately notify the Contracting Officer and installation environmental office.

INSTALLATION CERTIFICATION FOR CLEAN CONSTRUCTION DEBRIS TO BE REMOVED FROM EXCHANGE PROJECT SITE

As representative of _______________________________________(insert name of Installation), I am authorized to certify, and hereby do so certify, that the construction debris to be removed from the EXCHANGE project site at:

_____________________________________________________________________
(describe project and list address, for example Main Exchange Project, 111 Road A, X installation) has been inspected and is of no value to the United States and is free of all contamination, including but not limited to: lead paint, asbestos, PCBs, and pesticides.

CERTIFICATION:

Signed:  __________________________________________________________
Date:     _________________________
Printed Name, Rank or Grade, and Duty Title:
____________________________________________________

ORIGINAL OF THIS FORM MUST BE PROVIDED TO CONTRACTING OFFICER

END OF SECTION
SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

A. The General Contractor (GC) shall establish a quality control system to perform sufficient inspection and tests of all items of work, including that of the subcontractor(s) to insure conformation to applicable specifications and drawings with respect to the materials, workmanship, construction, finish and functional performance. GC is responsible for the quality of his work and the work of all the subcontractors. Tests of materials and/or special inspections will be made, when required by the specifications, by applicable law, rules and regulations in accordance with respective Sections of the specifications. Where required, the GC shall employ and pay for the services of an Independent Testing Agency to perform specific services and testing. Examples of such services are tests of fill materials, concrete materials, concrete mix design, asphalt concrete laboratory testing of materials proposed and calculations for asphalt concrete mixtures, etc.

B. GC shall arrange and pay for all services and testing which are not specifically indicated to be provided by EXCHANGE. All testing agencies used shall be approved by the Government.

C. If a material is not required to be field tested, the Contracting Officer may require the supplier to furnish with each delivery of such material, a certificate bearing legal signature of said supplier, stating that such material complies with specification requirements.

D. If any work or material requiring tests and inspections is executed, enclosed or covered before tests and inspections are made, or test reports distributed, the GC shall, at his own expense, uncover such part of this work or material and keep it uncovered until such tests and inspections have been made and test reports distributed. If work or material so tested and inspected shall not be found to conform to the requirements of the Construction Documents, it shall be deemed and construed to be defective materials or faulty workmanship and the GC, at its own expense, shall replace work or material removed and repair all work disturbed thereby.

1.02 RELATED REQUIREMENTS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Related requirements and tests are specified in Divisions 2 through 33.

1.03 EXCHANGE RESPONSIBILITY

A. EXCHANGE will employ and pay for the services of an Independent Testing Agency to perform specified quality control testing during construction, as indicated in the various specification sections.

1.04 CONTRACTOR'S RESPONSIBILITES

A. Cooperate with the Contracting Officer and Independent Testing Agency Laboratory personnel and provide access to work and to manufacturer's operations.

1. Provide samples of materials to be tested, in required quantities.

2. Furnish incidental labor and facilities required to provide access to work to be tested; to obtain and handle samples at the site; to facilitate inspections and tests; and for Independent Testing Agency Laboratory's exclusive use for storage and curing of test samples.

3. Notify Laboratory sufficiently in advance of operations to allow for its assignment of personnel and scheduling of tests.

4. When tests or inspections cannot be performed after such notice, reimburse Government for Independent Testing Agency personnel and travel expenses incurred by the Government due to the GC's negligence.

B. Provide to the testing agency the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.

C. Furnish copies of products test reports as required.
D. Employ and pay for the services of the testing agency to perform additional inspection, sampling and testing required:
   1. For the GC's convenience.
   2. When initial tests indicate work does not comply with Contract Documents.
   3. When, in the opinion of the Contracting Officer, additional tests or inspections are required because of the manner in which the GC executes the work. Examples of such tests and inspections are:
      a. Tests of materials substituted for previously accepted substituted or specified materials.
      b. Re-tests made necessary by failure of material to comply with the requirements of the specifications.
      c. Load tests made necessary because of portions of the structure not fully meeting specifications or plan requirements.

E. The use of EXCHANGE'S or GC's independent testing services shall in no way relieve the GC of the responsibility to furnish materials and construction in full compliance with the plans and specifications.

F. The Contractor shall coordinate with both EXCHANGE and his own testing laboratories so that the work will be inspected and tested according to contract requirements. This coordination includes notification of when tests should be taken, easy access to the work, and general cooperation in every way to insure proper control of the work.

G. Upon completion of the project, submit a notarized certificate stating tests for this work were made in accordance with provisions of these specifications and, further, all such tests and reports made were reported as required. This certificate shall list all tests and dates when work was completed.

1.05 QUALIFICATION OF TESTING AGENCY
   A. Meet basic requirements of ASTM E329 - "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction," latest edition.
   B. Authorized to operate in the state in which the project is located.

1.06 TESTING AGENCY RESPONSIBILITIES
   A. Cooperate with the Contracting Officer and GC; provide qualified personnel after due notice.
   B. Perform specified instructions, observations, sampling and testing of materials and methods of construction.
      1. Comply with specified standards.
   C. Promptly notify the Contracting Officer and GC of observed irregularities, deficiencies, or non-conformance of work or products.
   D. Promptly submit written report of each test and inspection. Each report shall include:
      1. Date issued.
      2. Project title and number.
      3. Testing laboratory name, address and telephone number.
      4. Name and signature of laboratory inspector.
      5. Date and time of sampling or inspection.
      6. Record of temperature.
      7. Date of test.
      8. Identification of product and specification section.
      9. Location of sample or test in the project.
      10. Type of inspection or test.
      11. Results of tests and compliance with Contract Documents.
      12. Interpretation of test results, when requested by the Contracting Officer.
   E. Report results of all tests in writing simultaneously to the following:
1. Contracting Officer or authorized representative: 3 copies
2. Site Inspector: 1 copy
3. General Contractor: 1 copy
4. Architect/Engineer: 1 copy

F. Perform additional tests as required by the Contracting Officer.
   1. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Contracting Officer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

G. Upon completion of the project, submit a notarized certificate stating tests for this work were made in accordance with provisions of these Specifications and, further, all such tests and reports made for job were reported as required.

1.07 LIMITATIONS OF AUTHORITY OF TESTING AGENCY
   A. Agency is not authorized to:
      1. Release, revoke, alter or enlarge on requirements of Contract Documents.
      2. Approve or accept any portion of the work.
      3. Assume any duties of the GC.
      4. Stop the Work.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.02 RELATED REQUIREMENTS
A. Section 01 10 00 - Summary: Work restrictions and limitations on utility interruptions.

1.03 USE CHARGES
A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner’s construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner’s existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner’s existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

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

B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
   1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
   2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
   3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
   1. Locations of dust-control partitions at each phase of work.
   2. HVAC system isolation schematic drawing.
   3. Location of proposed air-filtration system discharge.
   5. Other dust-control measures.

1.05 QUALITY ASSURANCE
A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board’s ADA-ABA Accessibility Guidelines.

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

PART 2 PRODUCTS
2.01 MATERIALS
A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top rails.
B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide galvanized-steel bases for supporting posts.
C. Wood Enclosure Fence: Plywood, 6 feet high, framed with four 2-by-4-inch rails, with preservative-treated wood posts spaced not more than 8 feet apart.
D. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
E. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.
F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.02 TEMPORARY FACILITIES
A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
   1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
   2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V AC duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
   3. Coffee machine and supplies.
   4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
   5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.

2.03 EQUIPMENT
A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00 - Project Closeout.

C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 01 10 00 - Summary.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
   a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
   b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.

2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.

3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
   1. Provide additional telephone lines for the following:
      a. Provide a dedicated telephone line for each facsimile machine in each field office.
   2. At each telephone, post a list of important telephone numbers.
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Contractor's emergency after-hours telephone number.
      e. Architect's office.
      f. Engineers' offices.
      g. Owner's office.
      h. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

K. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
   1. Processor: Intel Pentium D or Intel CoreDuo, 3.0 GHz processing speed.
   2. Memory: 4 gigabyte.
   4. Display: 22-inch LCD monitor with 256-Mb dedicated video RAM.
   5. Full-size keyboard and mouse.
   7. Operating System: Microsoft Windows 7 or higher.
   8. Productivity Software:
      a. Microsoft Office Professional, Windows 7 or higher, including Word, Excel, and Outlook.
      b. Adobe Reader 10.0 or higher.
      c. WinZip 7.0 or higher.
   9. Printer: "All-in-one" unit equipped with printer server, combining color printing, photocopying, scanning, and faxing, or separate units for each of these three functions.
   10. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 384 Kbps upload and 1 Mbps download speeds at each computer.
   11. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.

3.03 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Provide temporary or use designated areas of Owner’s existing parking areas, if available and approved by the Exchange for construction personnel.

D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

E. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs: Provide Project identification signs as indicated on Drawings.
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
      a. Provide temporary, directional signs for construction personnel and visitors.
   3. Maintain and touchup signs so they are legible at all times.

F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 71 00 - Cleaning.

G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

**3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION**

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
   1. Comply with work restrictions specified in Section 01 10 00 - Summary.

C. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

D. Site Enclosure Fence: Prior to commencing earthwork, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
   1.Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations or as indicated on Drawings.
   2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

G. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
H. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings.
   1. Construct covered walkways using scaffold or shoring framing.
   2. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
   3. Paint and maintain appearance of walkway for duration of the Work.

I. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
   1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

J. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.
   1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
   2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
   3. Insulate partitions to control noise transmission to occupied areas.
   4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
   5. Protect air-handling equipment.
   6. Provide walk-off mats at each entrance through temporary partition.

K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
   1. Prohibit smoking in construction areas.
   2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
   3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
   4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.05 MOISTURE AND MOLD CONTROL


B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
   1. Protect porous materials from water damage.
   2. Protect stored and installed material from flowing or standing water.
   3. Keep porous and organic materials from coming into prolonged contact with concrete.
   4. Remove standing water from decks.
   5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
   1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
   2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace, or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer’s written instructions for temperature, relative humidity, and exposure to water limits.
   a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
   b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
   c. Remove materials that can not be completely restored to their manufactured moisture level within 48 hours.

3.06 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
   3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 - Project Closeout.

END OF SECTION
SECTION 01 58 00
CONSTRUCTION SITE SIGN

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Project identification sign.
B. Project informational signs.

1.02 RELATED REQUIREMENTS
A. Section 01 10 00 - Summary: Responsibility to provide signs.

1.03 QUALITY ASSURANCE
A. Design sign and structure to withstand American Society of Civil Engineers (ASCE) Standard 7, 120 miles/hr wind velocity @ 3 seconds.
B. Sign Painter: Experienced as a professional sign painter for minimum three years.
C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Attached sign exemplars are current proposed templates from EXCHANGE. Obtain most recent sign template from EXCHANGE prior to producing sign layout.
C. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 PRODUCTS
2.01 SIGN MATERIALS
A. Structure and Framing: New, wood, structurally adequate.
B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch thick, 48 inches x 96 inches.
C. Rough Hardware: Galvanized.
D. Paint and Primers: Exterior quality, two coats, colors as selected.
E. Lettering: Exterior quality paint, colors as selected.

2.02 PROJECT IDENTIFICATION SIGN
A. One painted sign of construction, design, and content shown on one of the attachments, at location designated.
B. Graphic Design, Colors, Style of Lettering: Designated by Contracting Officer's Representative.

2.03 PROJECT INFORMATIONAL SIGNS
A. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot distance.
B. Provide at each field office, storage shed. Relocate as Work progress requires.

PART 3 EXECUTION
3.01 INSTALLATION
A. Install project identification sign within 30 days after date fixed by Notice to Proceed.
B. Erect at designated location.
C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
D. Install sign surface plumb and level, with butt joints. Anchor securely.
E. Paint exposed surfaces of sign, supports, and framing.
3.02 MAINTENANCE
   A. Maintain signs and supports clean, repair deterioration and damage.

3.03 REMOVAL
   A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

3.04 ATTACHMENTS
   A. Preferred Sign
   B. Alternate Sign

END OF SECTION
Your New
Ft. Bragg Shopping Center

CONTRACTOR'S NAME
Thistown, ST

ARCHITECT'S NAME
Thistown, ST

Another project funded using earnings from your Exchange purchases.

Preferred
PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Temporary field offices and sheds.
B. Maintenance and cleaning.
C. Removal.

1.02 RELATED SECTIONS
A. Section 01 10 00 - Summary.
B. Section 01 50 00 - Temporary Facilities and Controls.

PART 2 - PRODUCTS

2.01 MATERIALS, EQUIPMENT, FURNISHINGS
A. Materials, Equipment, Furnishings: Serviceable, new or used, adequate for required purpose.

2.02 CONSTRUCTION
A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.
B. Construction: Structurally sound, secure, weather tight enclosures for office and storage spaces. Maintain during progress of Work; remove at completion of Work.
C. Temperature Transmission Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
D. Exterior Materials: Weather resistant, finished in one color acceptable to Contracting Officer.
E. Interior Materials in Offices: Sheet type materials for walls and ceilings, pre-finished or painted; resilient floors and bases.
F. Lighting for Offices: 50 ft-C at desk top height, exterior lighting at entrance doors.
G. Fire Extinguishers: One 10# standard dry chemical (ABC) type fire extinguisher at each office and each storage area.
H. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.

2.03 ENVIRONMENTAL CONTROL
A. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain 68 degrees F heating and 76 degrees F cooling.
B. Storage Spaces: Heating and ventilation as needed to maintain Products in accordance with Contract Documents; adequate lighting for maintenance and inspection of Products.

2.04 CONTRACTOR OFFICE AND FACILITIES
A. Size: For Contractor's needs and to provide space for project meetings. Minimum size: 150 square feet.
B. Telephone: The Contractor shall install, maintain and pay for telephone service for the Contractor's field office including an answering device and outside bell.
C. Internet, E-Mail and Fax: Install, maintain and pay for services for the Contractor's Field Office.
D. Furnishings in Meeting Area: Conference table and chairs to seat at least eight persons; racks and files for Contract Documents, submittals, and project record documents.
E. Other Furnishings: Contractor's option.
F. Equipment: Six (6) adjustable band protective helmets for visitors, one 10 inch outdoor weather thermometer and a weather protected bulletin board for posting information required by the contract.
2.05 CONTRACTING OFFICER’S FIELD OFFICE

A. Separate space for sole use by the EXCHANGE Contracting Officer, with separate entrance
door with new lock and two keys.

B. Area: Minimum 150 sq ft, minimum dimension 8 ft.

C. Windows: Minimum three minimum total area of 10 percent of floor area, with operable sash
and insect screens. Locate to provide views of construction area.

D. Electrical Distribution Panel: Two circuits minimum, 110 volt, single phase service.

E. Minimum four 110 volt duplex convenience outlets, one on each wall.

F. Telephone: The Contractor shall install, maintain and pay for telephone service to the
Contracting Officer’s field office, including an answering device. The Contractor shall pay for
basic service and local calls only, but will not pay for long distance calls.

G. Furnishings:
   1. One desk 54 x 30 inch, with three drawers.
   2. One drafting table 36 x 72 inch, with one equipment drawer.
   3. Plan rack to hold working Drawings, shop drawings, and record documents.
   4. One standard four-drawer legal size metal filing cabinet with locks and two keys per lock.
   5. Six linear ft of metal bookshelves.
   6. Two swivel arm chairs.
   7. Two straight chairs.
   8. One drafting table stool.
   9. One tackboard 36 x 30 inch.
  10. One waste basket per desk and table.

2.06 STORAGE AREAS AND SHEDS

A. Size to storage requirements for products of individual Sections, allowing for access and orderly
provision for maintenance and for inspection of products.

PART 3 - EXECUTION

3.01 PREPARATION

A. Fill and grade sites for temporary structures to provide drainage away from buildings.

3.02 INSTALLATION

A. Install office spaces ready for occupancy 15 days after date of Notice to Proceed.

B. Employee Residential Occupancy: Not permitted on Installation property.

3.03 MAINTENANCE AND CLEANING

A. Weekly cleaning services for offices; periodic cleaning and maintenance for office and storage
areas.

B. Maintain approach walks free of mud, water, and snow.

3.04 REMOVAL

A. At completion of Work remove buildings, foundations, utility services, and debris. Restore
areas.

END OF SECTION
SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations and procedures.
E. Procedures for Owner-supplied products.
F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS
A. Section 00 04 04 - Substitutions.
B. Section 01 10 17 - EXCHANGE Furnished and Installed Equipment (EF/EI).
C. Section 01 10 18 - EXCHANGE Furnished, Contractor Installed Equipment (EF/CI).
D. Section 01 40 00 - Quality Requirements: Product quality monitoring.
E. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting packaging and substitutions.

1.03 REFERENCE STANDARDS
C. C2C (DIR) - C2C Certified Products Registry; Cradle to Cradle Products Innovation Institute; http://www.c2ccertified.org/products/registry.
D. EN 15804 - Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products; 2012.
E. GreenScreen (LIST) - GreenScreen for Safer Chemicals List Translator; Clean Production Action; www.greenscreenchemicals.org.
F. GreenScreen (METH) - GreenScreen for Safer Chemicals Method v1.2; Clean Production Action; www.greenscreenchemicals.org.
G. HPDC (Tool) - Create an HPD On-Line Tool; Health Product Declaration Collaborative; http://hpdcollaborative.org/manufacturers/.
H. ISO 14025 - Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures; 2006.

1.04 SUBMITTALS
A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
1. Submit within 15 days after date of Agreement.
2. For products specified only by reference standards, list applicable reference standards.
B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.05 QUALITY ASSURANCE

A. Bio-Based Content: Of vegetable or animal origin, not including products made by killing the animal.
   1. Determine percentage of bio-based content in accordance with ASTM D6866.
   2. Bio-based content must be sourced from a Sustainable Agriculture Network certified farm.

B. Cradle-to-Cradle Certified: End use product certified Cradle-to-Cradle v2 Basic or Cradle-to-Cradle v3 Bronze, minimum, as evidenced by C2C (DIR).

C. Environmental Product Declaration (EPD): Publicly available, critically reviewed life cycle analysis having at least a cradle-to-gate scope.
   2. Better: Industry-wide, generic; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
   3. Best: Commercial-product-specific; compliant with ISO 21930, or with ISO 14044, ISO 14040, ISO 14025, and EN 15804; Type III third-party certification with external verification, in which the manufacturer is recognized as the program operator.
   4. Where demonstration of impact reduction below industry average is required, submit both industry-wide and commercial-product-specific declarations; or submit at least 5 declarations for products of the same type by other manufacturers in the same industry.

D. GreenScreen Chemical Hazard Analysis: All ingredients of 100 parts-per-million or greater evaluated using GreenScreen (METH).
   1. Good: GreenScreen (LIST) evaluation to identify Benchmark 1 hazards; a Health Product Declaration includes this information.
   2. Better: GreenScreen Full Assessment.
   3. Best: GreenScreen Full Assessment by GreenScreen Licensed Profiler.

E. Health Product Declarations (HPD): Complete, published declaration with full disclosure of known hazards, prepared using HPDC (Tool); HPD's with "unknown" listed for any hazard will not be considered acceptable.

F. Manufacturer's Inventory of Product Content: Publicly available inventory of all ingredients identified by name and Chemical Abstract Service Registration Number (CAS RN).
   1. For ingredients considered a trade secret or intellectual property, the name and CAS RN may be omitted, provided the ingredient's role, amount, and GreenScreen Benchmark are given.

   1. Previously used, reused, refurbished, and salvaged products are not considered recycled.
   2. Wood fabricated from timber abandoned in transit to original mill is considered reused, not recycled.
3. Determine percentage of recycled content of any item by dividing the weight of recycled content in the item by the total weight of all material in the item.

4. Determine value of recycled content of each item separately, by multiplying the content percentage by the value of the item.

5. Acceptable Evidence:
   a. For percentage of recycled content, information from manufacturer.
   b. For cost, Contractor's cost data.

H. Reused Products: Materials and equipment previously used in this or other construction, salvaged and refurbished as specified.
   1. Wood fabricated from timber abandoned in transit after harvesting is considered reused, not recycled.
   2. Acceptable Evidence: Information about the origin or source, from Contractor or supplier.

I. Source Location: Location of harvest, extraction, recovery, or manufacture; where information about source location is required to be submitted, give the postal address:
   1. In all cases, indicate the location of final assembly.
   2. For harvested products, indicate location of harvest.
   3. For extracted (i.e. mined) products, indicate location of extraction.
   4. For recovered products, indicate location of recovery.
   5. For products involving multiple manufacturing steps, provide a description of the process at each step, with location.
   6. Acceptable Evidence:
      a. Manufacturer's certification.
      b. Life cycle analysis (LCA) performed by third-party.

J. Sustainably Harvested Wood: Solid wood, wood chips, and wood fiber certified or labeled by an organization accredited by the following:
   5. Acceptable Evidence: Copies of invoices bearing the certifying organization's certification numbers.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. DO NOT USE products having any of the following characteristics:
   1. Made using or containing CFC's or HCFC's.
   2. Made of wood from newly cut old growth timber.
   3. Containing lead, cadmium, asbestos.

C. Where all other criteria are met, Contractor shall give preference to products that:
1. If used on interior, have lower emissions, as defined in Section 01 61 16.
2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
3. Are extracted, harvested, and/or manufactured closer to the location of the project.
4. Have longer documented life span under normal use.
5. Result in less construction waste.
6. Are made of vegetable materials that are rapidly renewable.
7. Are made of recycled materials.
8. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.
9. If bio-based, other than wood, are or are made of Sustainable Agriculture Network certified products.
10. Are Cradle-to-Cradle Certified.
11. Have a published Environmental Product Declaration (EPD).
12. Have a published Health Product Declaration (HPD).
13. Have a published GreenScreen Chemical Hazard Analysis.
14. Have a published Manufacturer's Inventory of Chemical Content.

D. Provide interchangeable components of the same manufacture for components being replaced.
E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
F. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.03 PRODUCT OPTIONS
A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS
A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
B. Deliver and place in location as directed; obtain receipt prior to final payment.

PART 3 EXECUTION
3.01 SUBSTITUTION PROCEDURES
A. Section 00 04 04 - Substitutions specifies time restrictions and methodology for submitting requests for substitutions during the bidding period.
1. AFTER THE CONTRACT IS AWARDED, NO FURTHER SUBSTITUTIONS WILL BE PERMITTED.

3.02 OWNER-SUPPLIED PRODUCTS
A. See Section 01 10 17 - EXCHANGE Furnished and Installed Equipment (EF/EI): Schedules of Materials and Equipment (EF/EI).
B. See Section 01 10 18 - EXCHANGE Furnished, Contractor Installed Equipment (EF/CI): Schedule of Materials and Equipment (EF/CI).
C. Owner's Responsibilities:
1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
2. Arrange and pay for product delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

D. Contractor's Responsibilities:
   1. Review Owner reviewed shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING
   A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
   B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
   C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
   D. Transport and handle products in accordance with manufacturer's instructions.
   E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
   F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
   G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
   H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION
   A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
   B. Store and protect products in accordance with manufacturers' instructions.
   C. Store with seals and labels intact and legible.
   D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
   E. For exterior storage of fabricated products, place on sloped supports above ground.
   F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
   G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
   H. Comply with manufacturer's warranty conditions, if any.
   I. Do not store products directly on the ground.
   J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
   K. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
   L. Prevent contact with material that may cause corrosion, discoloration, or staining.
   M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Starting Systems.
   B. Demonstration and instructions.
   C. Testing, adjusting and balancing.

1.02 RELATED SECTIONS
   A. Section 01 40 00 - Quality Requirements: Manufacturers field reports.
   B. Section 01 77 00 - Project Closeout: System operation and maintenance data and extra materials.
   C. Section 23 05 93 - Testing, Adjusting and Balancing for HVAC: System Commissioning.

1.03 STARTING SYSTEMS
   A. Coordinate schedule for start-up of various equipment and systems.
   B. Notify Contracting Officer seven (7) working days prior to start-up of each item.
   C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
   D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
   E. Verify that wiring and support components for equipment are complete and tested.
   F. Execute start-up under supervision of applicable manufacturer's representative and/or Contractors' personnel in accordance with manufacturers' instructions.
   G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
   H. Submit a written report in accordance with Section 01 33 00 that equipment or system has been properly installed and is functioning correctly.

1.04 DEMONSTRATION AND INSTRUCTIONS
   A. Demonstrate operation and maintenance of products to EXCHANGE and Facility personnel two weeks prior to date of final inspection.
   B. Demonstrate project equipment by a qualified representative who is knowledgeable about the project.
   C. For equipment of systems requiring seasonal operation, perform demonstration for other season within six months.
   D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with AAFES/Installation personnel in detail to explain all aspects of operation and maintenance.
   E. Demonstrate start-up, operation, control adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed time at designated location.
   F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
   G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

1.05 TESTING, ADJUSTING AND BALANCING
   A. EXCHANGE will appoint, employ, and pay for services of an independent firm to perform testing, adjusting, and balancing.
   B. The independent firm will perform services specified in Section 23 05 93.
C. Reports will be submitted by the independent firm to the Contracting Officer indicating observations and results of tests and indicating compliance or non-compliance with the requirements of the Contract Documents.

PART 2 – PRODUCTS (NOT USED)
PART 3 – EXECUTION (NOT USED)

END OF SECTION
SECTION 01 71 00
CLEANING

PART 1 - GENERAL
1.01 SECTION INCLUDES
   A. Progress Cleaning.
   B. Final Cleaning.
1.02 RELATED SECTIONS
   A. General Provisions of the Contract.
   B. Section 01 10 00 - Summary.
   C. Section 01 14 50 - Cutting and Patching.
   D. Section 01 50 00 – Temporary Facilities and Controls.
   E. Individual Specification Sections - Cleaning Requirements.
1.03 SAFETY REQUIREMENTS
   A. Standards: Maintain project in accordance with the following safety and insurance standards:
   B. O.S.H.A. Standards:
      1. The Contractor shall be required to comply with OSHA Requirements in 29 CFR 1926 and 29 CFR in 1910. The OSHA Standards are subject to change, and such changes may affect the Contractor in his performance under the contract. It is the Contractor's responsibility to know such changes, effective dates of changes, and comply with all requirements.
   C. Hazards Control:
      1. Store volatile wastes in covered metal containers and remove from premises daily.
      2. Prevent accumulation of wastes which create hazardous conditions.
      3. Provide adequate ventilation during the use of volatile or noxious substances.
   D. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
      1. Do not burn or bury rubbish and waste materials on the installation.
      2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
      3. Do not dispose of wastes into streams or waterways.

PART 2 - PRODUCTS
2.01 MATERIALS
   A. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
   B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION
3.01 PROGRESS CLEANING
   A. Execute cleaning to ensure that the building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
   B. Maintain site in a clean and orderly condition.
   C. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
   D. Remove waste materials, debris, and rubbish from site and legally dispose of at public or private dumping areas off of Government property.
   E. Vacuum clean interior building areas when ready to receive finish painting, and continue cleaning to eliminate dust.
F. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights. Open free-fall chutes are not permitted.

G. Schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted surfaces.

3.02 FINAL CLEANING

A. Employ professional cleaners for final cleaning.

B. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces and of concealed spaces.

C. Remove grease, dust, dirt, stains, temporary labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine; finish vacuum carpeted and soft surfaces.

D. Repair, patch, and touch-up marred surfaces to specified finish, to match adjacent surfaces.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Broom clean paved surfaces; rake clean other surfaces of grounds.

G. Clean all glass.

H. Replace air conditioning filters if units were operated during construction.

I. Clean ducts, blowers, and coils, if air HVAC units were operated without filters during construction.

J. Maintain cleaning until project, or portion thereof, is occupied by EXCHANGE.

END OF SECTION
SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

B. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

C. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.

D. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

E. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 35 43 - Environmental Protection: Additional requirements for waste disposal.

B. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Submit Waste Management Plan within 10 calendar days after receipt of Notice of Award of Bid, or prior to any trash or waste removal, whichever occurs sooner; submit projection of all trash and waste that will require disposal and alternatives to landfilling.

C. Waste Management Plan: Include the following information:
   1. Analysis of the trash and waste projected to be generated during the entire project construction cycle, including types and quantities.
   2. Landfill Options: The name, address, and telephone number of the landfill(s) where trash/waste will be disposed of, the applicable landfill tipping fee(s), and the projected cost of disposing of all project trash/waste in the landfill(s).
   3. Landfill Alternatives: List all waste materials that will be diverted from landfills by reuse, salvage, or recycling.
      a. List each material proposed to be salvaged, reused, or recycled.
      b. List the local market for each material.
      c. State the estimated net cost, versus landfill disposal.
   4. Meetings: Describe regular meetings to be held to address waste prevention, reduction, recycling, salvage, reuse, and disposal.
   5. Materials Handling Procedures: Describe the means by which materials to be diverted from landfills will be protected from contamination and prepared for acceptance by designated facilities; include separation procedures for recyclables, storage, and packaging.
   6. Transportation: Identify the destination and means of transportation of materials to be recycled; i.e. whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Contracting Officer's Representative.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Pre-construction meeting.
   2. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. As a minimum, provide:
      a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
b. Separate dumpsters for each category of recyclable.
c. Recycling bins at worker lunch area.
2. Provide containers as required.
3. Provide temporary enclosures around piles of separated materials to be recycled or salvaged.
4. Provide materials for barriers and enclosures that are nonhazardous, recyclable, or reusable to the maximum extent possible; reuse project construction waste materials if possible.
5. Locate enclosures out of the way of construction traffic.
6. Provide adequate space for pick-up and delivery and convenience to subcontractors.
7. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
8. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Substantial Completion.
B. Final Inspections.
C. Operation and Maintenance Manual requirements.
D. Operation and Maintenance Instruction requirements.
E. DD Form 1354 requirements.
F. Warranty requirements.

1.02 RELATED SECTIONS
A. General Provisions of the Contract: Final Acceptance and Payment.
B. Section 01 33 00 - Submittals.
C. Section 01 65 00 - Starting of Systems.
D. Section 01 71 00 - Cleaning.
E. Section 01 78 39 - Project Record Documents.

1.03 SUBSTANTIAL COMPLETION
A. Preliminary Procedures: Before requesting Substantial Completion inspection, provide the following.
   1. Contractor's list of incomplete items (punch list).
      a. Submit PDF electronic file.
      b. Submit paper copies.
   2. Six copies of all Operation and Maintenance Manuals and all other close-out materials. These items shall be organized in 3-ring binders as described below.
   4. A digital copy of the "As-Built" Record Drawings and Specifications in PDF format, submitted to the Contracting Officer and Architect.
   5. Warranties, maintenance service agreements, and similar documents.
   6. Releases, occupancy permits, and operating certificates.
   7. Tools, spare parts, and extra materials, delivered to Contracting Officer's Representative.
   8. Final changeover of locks performed.
   9. Startup testing completed.
   11. Temporary facilities removed.
   12. Owner advised of heat and utility changeover.
   13. Owner advised of pending insurance changeover.
   15. Owner's personnel instructed in operation, adjustment, and maintenance of equipment and systems, including demonstration and training videotapes submitted.

B. Contractor:
   1. Submit written certification to Contracting Officer that project, or designated portion of Project, is substantially complete.
   2. Submit list of major items to be completed or corrected.

C. Contracting Officer will make an inspection after receipt of certification.

D. Should Contracting Officer consider that work is substantially complete:
   1. Contractor shall prepare, and submit to Contracting Officer, a list of items to be completed or corrected, as determined by the inspection.
2. Contracting Officer will prepare and issue a Certificate of Substantial Completion, containing:
   a. Date of Substantial Completion.
   b. Contractor's list of items to be completed or corrected, verified, and amended by Contracting Officer.
   c. The time within which Contractor shall complete or correct work of listed items.
   d. Time and date EXCHANGE will assume possession of work or designated portion thereof.
   e. Responsibilities of EXCHANGE and Contractor for:
      1) Utilities.
      2) Operation of mechanical, electrical, and other systems.
      3) Maintenance and cleaning.
      4) Security.
      5) Signatures of:
         (a) Contracting Officer.
         (b) Contractor.

3. EXCHANGE occupancy of project or designated portion of project:
   a. Contractor shall:
      1) Perform final cleaning in accordance with Section 01 71 00.
      2) EXCHANGE will occupy project, under provisions stated in Certificate of Substantial Completion.

4. Contractor: Complete work listed for completion or correction, within designated time.

E. Should Contracting Officer consider that work is not substantially complete:
   1. He shall immediately notify Contractor, in writing, stating reasons.
   2. Contractor: Complete work, and send second written notice to Contracting Officer, certifying that project, or designated portion of project, is substantially complete.
   3. Contracting Officer will reinspect work.

1.04 FINAL INSPECTION
   A. Contractor shall submit written certification that:
      1. Contract documents have been reviewed.
      2. Project has been inspected for compliance with contract documents.
      3. Work has been completed in accordance with Contract Documents.
      4. Equipment and systems have been tested in presence of Facility Representatives and are operational.
      5. Project is completed and ready for final inspection.
   B. Contracting Officer will make final inspection after receipt of certification.
   C. Should the Contracting Officer consider that work is finally complete in accordance with requirements of contract documents, he shall request Contractor to make project closeout submittals.
   D. Should the Contracting Officer consider that work is not finally complete:
      1. He shall notify Contractor, in writing, stating reasons.
      2. Contractor shall take immediate steps to remedy the stated deficiencies, and send second written notice to the Contracting Officer certifying that work is complete.
      3. The Contracting Officer will reinspect work.

1.05 PROJECT RECORD DOCUMENTS
   A. Project Record Documents: Provide as specified in Section 01 78 39.

1.06 OPERATION AND MAINTENANCE MANUALS
   A. Submit data bound in 8-1/2 x 11 inch text pages, three D side ring binders with durable plastic covers.
   B. Prepare binder cover with printed title "Operation and Maintenance Manual," title of project, and subject matter of binder when multiple binders are required.
C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, typed on 24 pound white paper, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Catalogue data on plumbing fixtures, valves, water heaters, heating and cooling equipment, temperature control, fan, electrical panels, service entrance equipment and light fixtures.
      d. Parts list for each component.
      e. Operating instructions.
      f. Valve chart.
      g. Maintenance instructions for equipment and systems.
      h. Start-up procedures.
      i. Emergency procedures.
      j. Shut-down procedures.
      k. Manufacturer's name, type, color designation for ceramic tile, resilient flooring, windows, doors, brick, concrete block, paint, roofing and other materials.
      l. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of warranties.
      e. Training Sessions attendance roster.
      f. Warranties.

E. Submit six (6) hard copies and one PDF digital copy of the Operation and Maintenance Manuals to the Contracting Officer.
   1. Make any additions or revisions to the Operation and Maintenance Manuals as directed by the Contracting Officer or Architect following Substantial Completion review.

1.07 OPERATION AND MAINTENANCE INSTRUCTION

A. The Contractor shall provide, at his expense, manufacturer's representatives to completely check out all mechanical and electrical systems and items covered by the drawings and specifications. This requirement shall be scheduled just prior to, and during the initial start up. After all systems are functioning properly, the representatives shall instruct Facility Maintenance Personnel in the proper operation and maintenance of each item. In addition to instructions given at the project, the Facility Maintenance Personnel shall be given a classroom instruction course on operation and maintenance of the systems. Training sessions shall be limited to four (4) continuous hours where practical. Schedule additional four (4) hour sessions as required.

1.08 DD FORM 1354

A. Preparation of DD Form 1354 "Transfer and Acceptance of Military Real Property": At the conclusion of the project the Contractor will compile and furnish to the Contracting Officer certain costs and quantity data of materials and systems furnished and installed. A list of items for which the costs and quantity data are required will be furnished to the Contractor. Such information will be returned to the Contracting Officer within 10 days from the receipt of the list.
   1. Form is attached at the end of this Section.
1.09 WARRANTY AND EXTENDED WARRANTIES

A. Upon completion of project, prior to final payment, guarantees required by technical divisions of Specifications shall be properly executed in quadruplicate by subcontractors and submitted to Contracting Officer. Delivery of guarantees shall not relieve Contractor from any obligation assumed under contract.

B. Submit guarantee covering entire project for one year. In addition, where separate guarantees for certain portions of work are for longer periods, General Contractor's guarantee shall be extended to cover such longer periods.

C. Guarantees shall become valid and operative upon issuance of Certificate of Inspection and Acceptance by EXCHANGE. Guarantees shall not apply to work where damage is a result of abuse, neglect by EXCHANGE, or its successor(s) in interest.

PART 2 - PRODUCTS (NOT USED)
PART 3 - EXECUTION (NOT USED)

END OF SECTION
SUGGESTED INSTRUCTIONS FOR PREPARING DD FORM 1354
(TRANSFER AND ACCEPTANCE OF MILITARY REAL PROPERTY)

1. The page number and the total number of pages comprising each transfer shall be shown in the space provided at the top right-hand part of the form.

2. When two or more pages are required, Items 27 through 29 shall be completed only on the final page. In such cases, the bottom portion of the form shall be torn off of all pages, except the final page, at the line above Items 27 and 28.

ITEM 1 - Self – explanatory

ITEM 2 - Primarily for Navy use, the district number will be assigned by area or district public works office in accordance with coding pattern set forth in NAVEXOS P-1570, par. 3805-7, Item 6. For Army use, enter appropriate Army Engineer district where construction is performed and/or from which the transfer is made. For transfer of construction to the Air Force, enter appropriate Army Engineer district or the district number assigned by area, or Naval district public works office from which the construction transfer is made.

ITEM 4 - For Navy use only, see NAVEXOS P-1570, par. 3805-7, Item 5.

ITEM 5 - Enter date of preparation.

ITEM 6 – For Army use, enter appropriate Army job and directive number. For Air Force use, enter base job number, as appropriate, when form is used for transfer within the Air Force.

ITEM 7 – For Army use, or for transfer of construction to the Air Force, enter separate series of numbers, by fiscal year, for each installation to which real property is transferred; e.g., for FY 1962 show 62-1, 62-2, etc. For Navy use, this serial number will be assigned by respective area or district public works office and will represent the numerical sequence of submissions by respective contract number.

ITEM 8 – Insert appropriate contract number.

ITEM 9 – Self-explanatory.

ITEM 10 – 12: Instructions for Items 2,3 and 4 apply. (not applicable for Air For Use.)

ITEM 13 – For Navy use only. Insert the accounting number assigned to or used by the activity named in accordance with Item 9. See NAVEXOS P-1570, par. 3805-7, Item 10.

ITEM 14 – For Navy use only. Insert the accounting number assigned to the activity performing the official property accounting for the activity shown in Item 9. See NAVCompt Manual, Vol. 2, Chapter 5, for accounting numbers.

ITEM 15 – Insert an “X” in the appropriate box of block (A) to indicate whether the transfer involves new construction, existing facilities or capital improvements to existing facilities. If the “other” category is used, explain in remarks, Item 31. Additionally, insert an “X” in the appropriate box of block (B) to indicate whether transfer is being made at time of beneficial occupancy, physical completion or financial completion (with respect to new construction). If the “other” category is used, explain in remarks, Item 31.

ITEM 16 – Enter the code number assigned to identify the project with the appropriate construction authorization law.

ITEM 17 – Each single entry will be identified as an item number and this item number will be shown in this column.

ITEM 18 – 19: Category Code and Description. Enter the category code and description (see DoD Instruction 4165.3 (reference (a)) or attachment 1 to enclosure 1 to DoD Instruction 4165.14 (reference (b)) that appropriately describes the primary use for which the facility (buildings, structures, utilities) is designed. Not more than one category code (Item 18) will be listed as a line item (Item 17).
ITEM 20 – Number of Units in terms of buildings or other structures.

ITEM 21 – Type – enter type of construction; i.e., “P” for permanent, “S” for semipermanent or “T” for temporary.

ITEM 22 – Enter the unit of measure abbreviation, such as “SF” for square feet, etc. (see attachment 2 to enclosure 1 to DoD Instruction 4165.14 (reference (b)).

ITEM 23 – Enter total quantity as described in Item 22.

ITEM 24 – Indicate by item number, category code, and description the appropriate cost. In those instances where a document is prepared which lists items carrying costs which, in some cases, may be final and in others may be preliminary, each cost figure by line item will carry an alphabetical suffix of (P) for preliminary or (F) for final.


#First amendment (Ch 1, 7/28/67)
## Transfer and Acceptance of Military Real Property

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>CATEGORY CODE</th>
<th>FACILITY (category description)</th>
<th>NO. OF UNITS</th>
<th>TYPE</th>
<th>UNIT OF MEAS</th>
<th>TOTAL QUANTITY</th>
<th>COST</th>
<th>DRAWING NUMBERS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>4165</td>
</tr>
</tbody>
</table>

### Statement of Completion

The facilities listed hereon are in accordance with maps, drawings, and specifications and change orders approved by the authorized representative of the using agency except for the deficiencies listed on the reverse side.

### Accepted by

**DATE**

**SIGNATURE**

**TITLE (Post Engr./Base Engr./Navy Rep.)**

**PROPERTY VOUCHER NUMBER**
This form has been designed and issued for use in connection with the transfer of military real property between the military departments and to or from other government agencies. It supersedes ENG Forms 290 and 290B (formerly used by the Army and Air Force) and NAVDOCKS Form 2317 (formerly used by the Navy).

Existing instruction issued by the military departments relative to the preparation of the three superseded forms are applicable to this form to the extent that the various items and columns on the superseded forms have been retained. Additional instructions, as appropriate, will be promulgated by the military departments in connection with any new items appearing hereon.

With the issuance of this DD form, it is not intended that the department shall revise and reprint manuals and directives simply to show the number of this DD form. Such action can be accomplished through the normal course of revision for other reasons.
ITEMS FOR DD FORM 1354

CATEGORY CODES: VERIFY FOR ARMY FACILITIES AND AIR FORCE FACILITIES OF THE SAME DESCRIPTION • • • (ABBREVIATION-NOMENCLATURE)

* DESCRIPTION: ARMY AIR FORCE

SHOPPING CENTER: (EXCH MAIN RETL): 740-53 (EXCH SALES STORE) 740111
SHOPPETTE (EXCHANGE BRANCH): 740-50 (EXCH BRANCH) 740382
CLASS SIX (CLASS VI): 740-84 (BSE PACKAGE STORE) 740269
CAR CARE CENTER (EXCH SVC STA): 740-52 (EXCH SVC STN) 740383
BURGER KING (POST RESTAURANT): 740-64 (EXCH CAFE SNK BAR) 722345

<table>
<thead>
<tr>
<th>CATEGORY CODE</th>
<th>DESCRIPTION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. BUILDING SQUARE FOOTAGE:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. RETAIL AREAS: ________SF</td>
<td>B. ADMIN/EMPLOYEE AREA ________SF</td>
<td></td>
</tr>
<tr>
<td>C. MPA: ________SF</td>
<td>D. SERVICES ACTIVITIES: ________SF</td>
<td></td>
</tr>
<tr>
<td>E. FOOD ACTIVITIES ________SF</td>
<td>F. MALL/PUBLIC TOILETS: ________SF</td>
<td></td>
</tr>
<tr>
<td>G. MERCH. EQUIP. RM ________SF</td>
<td>H. TOTAL BLDG: ________SF</td>
<td></td>
</tr>
<tr>
<td>2. BUILDING $</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>(TOTAL CONTRACT PRICE LESS THE SUM OF THE FOLLOWING)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. HEATING, VENTILATION &amp; AIR CONDITIONING SYSTEM $</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>TOTAL: ______________ TONS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(AR)826-11 OVER 100 TONS (AC PL OV 110 TN)
(AR)826-12 26-100 TONS (AC PL-26-100 TN)
(AR)826-13 6-25 TONS (AC PL 6-25- TN)
(AR)890121 5-25 TONS (A/C PL 5 TO 25 TN)

4. FIRE PROTECTION SYSTEM (FIRE ALARM SYS)
AUTOMATIC SPRINKLER SYSTEM $  
(AR)880-50 (AUTO SPNLKR SYS)  
(AR)880221 (AUTO FR DTECTN SYS)  
TOTAL: NUMBER OF HEADS ______________
FOAM FIRE SPRINKLER SYSTEM $  
(AR)880-60 (AUTO SPNLKR SYS)  
(AR)980235 (DRY CHEM SYS)  
TOTAL: NUMBER OF HEADS ______________
FIRE HYDRANTS $  
(AF)843-11 FIRE HYDRANTS  
(AF)843315 (FR HYDR)  
TOTAL SERVICE TO BUILDING: ________ L.F OF ________ IN. CONDUIT AND ________ CONDUCTOR $  

(AR)812-42 UNGD ELEC DISTR  
(AF) (SEC DISTR LNE UG)  
(AF)890181 (UTIL LNE DUCTS)
ITEMS FOR DD FORM 1354 (CONTINUED)

<table>
<thead>
<tr>
<th>CATEGORY CODE</th>
<th>DESCRIPTION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. ELECTRICAL TRANSFORMER</td>
<td>Pad Mounted Transformer</td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)813-60 (TRANSFORMER)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AF)812225 (PRIM DISTR LNE UG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. NATURAL GAS LINE TO BUILDING (INC. METER)</td>
<td></td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)824-10 (GAS PIPE LIBE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AF)824464 (GAS MAINS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SERVICE TO BUILDING: ___________ L.F. OF _______ IN. PIPE</td>
<td></td>
<td>(MATERIAL: ________________ )</td>
</tr>
<tr>
<td>8. UNDERGROUND TELEPHONE</td>
<td></td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)..... (UNDG TELEPHONE)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AF)135583 (TEL DUCT FCLTY)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AF)890181 (UTIL LNE DUCTS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SERVICE TO BUILDING: ___________ L.F. OF _______ IN. CONDUIT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. SANITARY SEWER SYSTEM</td>
<td></td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)832-10 (SANITARY SEWER)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AF)932267 (SAN SEWAGE MAIN)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SERVICE TO BUILDING: ___________ L.F. OF _______ IN. PIPE</td>
<td></td>
<td>(MATERIAL: ________________ )</td>
</tr>
<tr>
<td>10. GREASE INTERCEPTOR</td>
<td></td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)833-90 (LOCAL DESCRIPTION)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAPACITY ___________GALLONS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. STORM SEWER SYSTEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AR)871-10 (STORM SEWER)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(AF)871183 (STRM DRN DSPL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL SERVICE TO BUILDING: ___________ L.F. OF _______ IN. PIPE</td>
<td></td>
<td>(MATERIAL: ________________ )</td>
</tr>
<tr>
<td>12. DOMESTIC WATER SYSTEM</td>
<td></td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)842-10 (WATER PIPE LN P)</td>
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</tr>
<tr>
<td>(AF)842245 (WTR DISTR MAINS)</td>
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<tr>
<td>TOTAL SERVICE TO BUILDING: ___________ L.F. OF _______ IN. PIPE</td>
<td></td>
<td>(MATERIAL: ________________ )</td>
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<tr>
<td>13. LANDSCAPE IRRIGATION SYSTEM</td>
<td></td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)871-30 (IRRIGATION FAC)</td>
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<tr>
<td>TOTAL NUMBER OF HEADS ___________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. DUMPSTER ENCLOSURE</td>
<td></td>
<td>$ ______________________</td>
</tr>
<tr>
<td>(AR)833-12 (REFUSE COLL BLD)</td>
<td></td>
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<tr>
<td>TOTAL AREA: ___________ S.F.</td>
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ITEMS FOR DD FORM 1354 (CONTINUED)

<table>
<thead>
<tr>
<th>CATEGORY CODE</th>
<th>DESCRIPTION</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. PAVING (NON ORGANIZATION VEHICLE PARKING)</td>
<td>(NON ORG VEH PRK)</td>
<td>$________________________</td>
</tr>
<tr>
<td>(AF)852262</td>
<td>(VEH PKING N/ORGN)</td>
<td>TOTAL ASPHALT PAVING:_______ S.Y. OF ______ IN. THICK W/_______IN. BASE MATERIAL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TOTAL CONCRETE PAVING:_______ S.Y. OF ______ IN. THICK W/_______IN. BASE MATERIAL</td>
</tr>
<tr>
<td>16. CONCRETE WALKS, SLABS &amp; PADS</td>
<td>(AR)852-20</td>
<td>(SIDEWALK)</td>
</tr>
<tr>
<td>(AF)852289</td>
<td>(SIDEWALK) PEDESTRIAN TRAFFIC</td>
<td>TOTAL AREA:___________ S.F. (EXCLUDING PAVER TILES)</td>
</tr>
<tr>
<td>17. CONCRETE CURBS &amp; GUTTERS</td>
<td>(AR)851-10</td>
<td>(ROADS PAVED)</td>
</tr>
<tr>
<td>(AF)851143</td>
<td>(CURBS &amp; GUTTERS)</td>
<td>TOTAL AREA:___________ L.F.</td>
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<tr>
<td>18. EXTERIOR SITE LIGHTING (EXT LIGHTING)</td>
<td>(AR)812-30</td>
<td>(EXT LIGHTING)</td>
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<tr>
<td>(AF)812926</td>
<td>(EXTERIOR AREA LTG)</td>
<td>TOTAL NUMBER OF POLES______________</td>
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<tr>
<td>19. LANDSCAPING (RELATED LAND IMPROV NB)</td>
<td>(AR)871-75</td>
<td>(RELATED LAND INPROV NB)</td>
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<tr>
<td>20. GASOLINE DISPENSING SYSTEMS</td>
<td>(AR)411-90</td>
<td>(LOCAL DESCRIPTION)</td>
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<tr>
<td>UNDERGROUND STORAGE TANKS:</td>
<td>NUMBER OF TANKS:_____ SIZE:______ GALLONS</td>
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<tr>
<td>NUMBER OF DISPENSERS:_______</td>
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<tr>
<td>NUMBER OF HOSES:______________</td>
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<tr>
<td>CANOPY SIZE:_______ SF $______________</td>
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<tr>
<td>KIOSKS: NUMBER_______ MGFR_______ COST $______________</td>
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<tr>
<td>21. CHAIN LINK FENCING (FENCE OR WALLS)</td>
<td>(AR)872-10</td>
<td>(FENCE OR WALLS)</td>
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<tr>
<td>(AF)872248</td>
<td>(FENCE INTERIOR)</td>
<td>TOTAL LINEAR FEET:___________ L.F.</td>
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<tr>
<td>22. TOTAL CONSTRUCTION COSTS:</td>
<td></td>
<td>$________________________</td>
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</table>
ITEMS FOR DD FORM 1354  (CONTINUED)

ADDITIONAL INFORMATION REQUIRED

MECHANICAL SYSTEMS

H.V.A.C. UNITS

<table>
<thead>
<tr>
<th>#</th>
<th>MANUFACTURER</th>
<th>MODEL #</th>
<th>CAPACITY</th>
<th>SERIAL #</th>
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EXHAUST FANS

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<th>MANUFACTURER</th>
<th>MODEL #</th>
<th>CAPACITY</th>
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<tbody>
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SUPPLY FANS

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<tr>
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<th>MODEL #</th>
<th>CAPACITY</th>
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<td>4.</td>
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</table>

CHILLER

BOILER

HEAT PUMP

ROOFTOP A/C UNITS

DOCK LEVELERS

DOCK SHELTERS

ELECTRICAL

DISTRIBUTION PANELS / LIGHT FIXTURES

<table>
<thead>
<tr>
<th>ITEM NO</th>
<th>MANUFACTURER</th>
<th>MODEL NUMBER</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
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PLUMBING

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<tr>
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<th>MANUFACTURER</th>
<th>MODEL #</th>
<th>CAPACITY</th>
<th>SERIAL #</th>
</tr>
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<tbody>
<tr>
<td>WATER HEATER</td>
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<tr>
<td>WATER CLOSET</td>
<td></td>
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<tr>
<td>WATER CLOSET (H.C.)</td>
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<td>URINAL</td>
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<td>LAVATORY</td>
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<td>LAVATORY (H.C.)</td>
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<td>FLOOR SINKS(##)</td>
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<tr>
<td>FLOOR DRAINS(##)</td>
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<tr>
<td>MOP SINK</td>
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<tr>
<td>ROOF DRAINS (##)</td>
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</tbody>
</table>
ITEMS FOR DD FORM 1354  (CONTINUED)

ADDITIONAL INFORMATION REQUIRED

FIRE PROTECTION SYSTEMS FOR FOOD ACTIVITIES

ANSUL CHEMICAL FIRE SUPPRESSION SYSTEM

TYPE OF SYSTEM:__________

TOTAL NUMBER OF:
- HEADS_________
- AUTOMAN RELEASE_________
- REMOTE MANUAL PULL STATIONS_________
- SNAP ACTION ASSEMBLIES____________
- MECHANICAL GAS SHUTOFF VALVES_______

ITEMS REQUIRED IN CLOSE OUT DOCUMENTS

1. GENERAL CONTRACTOR’S TESTING / TRAINING REPORTS:
   A. TEST AND BALANCE REPORT ON MECHANICAL SYSTEMS
   B. CERTIFICATION OF GROUNDING (RESISTANCE) POWER
   C. INSTRUCTION / TRAINING SESSIONS ON ALL
      MECH/ELEC/EQUIPMENT (INCLUDING PARTICIPANTS’ ROSTER)

2. GENERAL CONTRACTOR’S WARRANTY
3. ROOF(S) WARRANTY
4. ELECTRIC WARRANTY
5. HVAC WARRANTY
6. GREENHOUSE WARRANTY
7. TERMITE PROTECTION GUARANTEE
8. GENERAL CONTRACTOR’S STATEMENT ON “NO ASBESTOS BEARING
   MATERIALS” USED IN CONSTRUCTION
**TRANSFER AND ACCEPTANCE OF DoD REAL PROPERTY**

The public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Washington Headquarters Services, Executive Services Directorate, Information Management Division, 4800 Mark Center Drive, Alexandria, VA 22350-3100 (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE ABOVE ORGANIZATION.**

1. FROM (Organization Name)

2. DATE PREPARED (YYYYMMD)

3. PROJECT/JOB NUMBER

4. SERIAL NUMBER

5. TO (Organization - Installation Code and Name)

6. RPSUID/SITENAME/ INSTCODE/INSTNAME

7. CONTRACT NUMBER(S)

8. TRANSACTION DETAILS
   a. ACQUISITION BY CONSTRUCTION
   b. TOTAL ASSET
   c. PARTIAL ASSET
   d. TRANSFER BETWEEN SERVICES
   e. CAPITAL IMPROVEMENT
   f. INVENTORY ADJUSTMENT

9. ITEM NO.

10a. FACILITY NO.

10b. RPUID

11. CATEGORY CODE

12. CATCODE DESCRIPTION

13. TYPE CODE

14. SUST. CODE

15. PRIMARY UM

16. PRIMARY UM QUANTITY

17. SECONDARY UM

18. SECONDARY UM QUANTITY

19. COST

20. FUND SOURCE

21. FUND ONG

22. INTER-EST CODE

23. ITEM REMARKS

24. STATEMENT OF COMPLETION. The facilities listed hereon are in accordance with maps, drawings, and specifications and change orders approved by the authorized representative of the using agency except for the deficiencies listed on the reverse side.

   a. TRANSFERRED BY (Typed Name and Signature)

   b. DATE SIGNED (YYYYMMD)

   c. TITLE (Area Engr./Base Engr./DPW/Construction Agent)

25a. ACCEPTED BY (Typed Name and Signature)

   b. DATE SIGNED (YYYYMMD)

   c. TITLE (DPW/DMR)

26. PROPERTY VOUCHER NUMBER

**DD FORM 1354, AUG 2013**

PREVIOUS EDITION MAY BE USED.
### CONSTRUCTION DEFICIENCIES

**INSTRUCTIONS**

**GENERAL.** This form has been designed and issued for use in connection with the transfer of military real property between the military departments and to or from other government agencies. It supersedes ENG Forms 290 and 290B (formerly used by the Army and Air Force) and NAVDOCKS Form 2317 (formerly used by the Navy). Existing instructions issued by the military departments relative to the preparation of DD Form 1354 are applicable to this revised form to the extent that the various items and columns on the superseded forms have been retained. The military departments may promulgate additional instructions, as appropriate.

For detailed instructions on how to fill out this form, please refer to Unified Facilities Criteria (UFC) 1-300-08, dated 16 April 2009 or later.

**SPECIFIC DATA ITEMS.**

1. **From.** Name of the transferring agency.
2. **Date Prepared.** Date of actual preparation. Enter all dates in YYYYMMDD format (Example: March 31, 2010 = 20100331).
3. **Project/Job Number.** Project number on a DD Form 1391 or Individual Job Order Number.
4. **Serial Number.** Sequential serial number assigned by the preparing organization (e.g., 2010-0001).
5. **To.** Name and address of the receiving installation, activity, and Service of the transferring individual or agent.
6. **RPSUID/SITENAME/INSTCODE/INSTNAME.** Site Unique Identifier and name or installation code and name where the constructed facility is located.
7. **Contract Number(s).** Contract number(s) for this project.
8. **Placed-In-Service Date.** RPA Placed In Service Date. This is the date the asset is actually placed-in-service.
9. **Transaction Details.**
   a. **Method of Transaction.** Mark (X) as many boxes as apply.
   b. **When/Event.** When or event causing preparation of DD Form 1354. X only one box.
   c. **Type.** Draft, interim, or final DD Form 1354. X only one box.
10. **Item Number.** Use a separate item number for each facility, no item number for additional usages.
11. **Category Code.** The category code describes the facility usage.
12. **Type.** Type of construction: P for Permanent; S for Semi-permanent; T for Temporary.
13. **Sustainability Code.** Reports whether or not an asset meets the sustainability guidelines set forth in Section 2(g) of Executive Order 13514. Valid values are: 1 (asset meets the guidelines); 2 (asset does not meet the guidelines); 3 (asset not evaluated); 4 (asset not subject to guidelines).
14. **Area: UM 1.** Area unit of measure; use the unit of measure associated with the category code selected in 11.
15. **Cost.** Cost for each facility; for capital improvements, enter N/A.
16. **Total Quantity UM 1.** The total area for the measure identified in Item 15. Use negative numbers for demolition.
17. **Other: UM 2.** Unit of Measure 2 is the capacity or other measurement unit (e.g., LF, MB, EA, etc.).
18. **Total Quantity UM 2.** The total capacity/other for the measure identified in Item 17.
19. **Funding Organization.** Enter the code for the organization responsible for acquiring this facility.
20. **Fund Source.** Enter the Fund Source Code for this item.
21. **Construction Deficiencies.** List construction deficiencies in project during contractor turnover inspection.
22. **Project Remarks.** Project level remarks and continuation of blocks.

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**PROJECT REMARKS**

**INSTRUCTIONS**

10a. **Facility Number.** Assigned in accordance with the Installation/Base Master Numbering Plan.
10b. **RPUID.** Identified in Real Property Inventory.
11. **Category Code.** The category code describes the facility usage.
12. **Type.** Type of construction: P for Permanent; S for Semi-permanent; T for Temporary.
13. **Sustainability Code.** Reports whether or not an asset meets the sustainability guidelines set forth in Section 2(g) of Executive Order 13514. Valid values are: 1 (asset meets the guidelines); 2 (asset does not meet the guidelines); 3 (asset not evaluated); 4 (asset not subject to guidelines).
14. **Area: UM 1.** Area unit of measure; use the unit of measure associated with the category code selected in 11.
15. **Cost.** Cost for each facility; for capital improvements, enter N/A.
16. **Total Quantity UM 1.** The total area for the measure identified in Item 15. Use negative numbers for demolition.
17. **Other: UM 2.** Unit of Measure 2 is the capacity or other measurement unit (e.g., LF, MB, EA, etc.).
18. **Total Quantity UM 2.** The total capacity/other for the measure identified in Item 17.
19. **Funding Organization.** Enter the code for the organization responsible for acquiring this facility.
20. **Fund Source.** Enter the Fund Source Code for this item.
21. **Construction Deficiencies.** List construction deficiencies in project during contractor turnover inspection.
22. **Project Remarks.** Project level remarks and continuation of blocks.
SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS
   A. Section 01 33 00 – Submittals.

1.02 RECORD FIELD DATA
   A. General: Maintain at job site, two complete sets of Contract Documents. During construction, both sets shall be marked to show all deviations in actual construction from the Contract Documents.
      1. Red Markers: Indicate all additions.
      2. Green Markers: Indicate all deletions.
   B. Record Documents: The drawings shall show, but no be limited to, the following information:
      1. Locations and description of any utility lines and other installations of any kind or description known to exist within the construction area. Include dimensions and/or survey coordinates to permanent features.
      2. Locations and dimensions of any changes within the building or structure and the accurate location and dimension of all underground utilities and facilities.
      3. Correct grade or alignment of roads, structures and utilities if any changes were made from Contract Drawings.
      4. Correct elevations if changes were made in site grading.
      5. Changes in details of design or additional information obtained from shop drawings prepared or furnished by the Contractor including, but not limited to:
         a. Fabrication erection
         b. Installation and placing details
         c. Pipe sizes
         d. Insulation materials
         e. Equipment pad dimensions
      6. Topography and grades of all drainage.
      7. All changes or modifications from the original design.
      8. Where contract drawings or specifications allow options, only the option actually used in the construction shall be shown on the Record Drawings. The option not used shall be deleted.
   C. Record Field Data: All deviations shall be shown in the same general detail utilized in the Contract Documents. Marking of the documents shall continue throughout construction to keep the documents up to date.
      1. Additional Data: The Contractor shall maintain the following:
         a. Full size marked-up drawings.
         b. Survey notes
         c. Sketches
         d. Nameplate data
         e. Pricing information
         f. Description and serial number of all equipment
      2. Record field data shall be available for inspection by the Contracting Officer whenever requested and shall be jointly inspected for accuracy and completeness by the Contracting Officer and Contractor. Failure to keep record field data current shall be sufficient justification to withhold a retained percentage from the monthly Application for Payment.
   D. Submittal of Record Field Data:
      1. Submit two sets to the Contracting Officer a minimum of 20 calendar days prior to the date of final inspection.
      2. The Contractor shall make all corrections identified during Contractor Officer review and resubmit corrected data within ten (10) calendar days of receipt.
3. When data is accepted as complete, one set of documents will be returned to the Contractor for completion of the Record Documents.

1.03 RECORD ELECTRONIC FILE DOCUMENTS

A. Electronic File Format: No earlier than 30 days after award, the Contracting Officer will provide one set of AutoCAD electronic file format contract drawings to be used for preparation of Record Drawings.
   1. Media: ISO – 9660 CD
   2. The Contractor shall verify usability of AutoCAD files and notify the Contracting Officer of any discrepancies within 30 calendar days of receipt. Any discrepancies will be corrected and files returned to the Contractor.
   3. The Contractor shall incorporate all deviations from the original Contract Documents as recorded in the approved “Record Field Data” as indicated in Paragraph 1.2.C above.
   4. The Contractor shall also incorporate all written modifications to the Contract Documents which were issued by amendment or contract modification.
   5. All revisions and changes shall be incorporated:
      a. Items marked deleted shall be deleted.
      b. Clouds around new items shall be removed.

B. Electronic File Submittal: Submit a complete set of Record Drawings in AutoCAD electronic file format no later than 30 days after final acceptance. The Record Drawings shall be done in equal quality to the originals, including line work, line weights, lettering and symbols. Identify each drawing with the word “RECORD” in block letters at least 3/8” high above the title block. The date of completion and the words “Revised Record” shall be placed in the revision block above the latest revision notation.
   1. Format: AutoCAD Release 2005 'DWG' format. All support files required to display or plot the files in the same manner as they were developed shall be delivered along with the files, including but not limited to:
      a. Font files
      b. Menu files
      c. Plotter setup
      d. Referenced files
   2. Layering: Conform to AIA Standard Document, “CAD Layer Guidelines,” latest version. An explanatory list of which layer is used at which drawing and an explanatory list of all layers which do not conform to the standard AIA CAD Layer Guidelines including any user definable fields permitted by the guidelines shall be provided with each submittal.
   3. Electronic File Deliverable Media: ISO 9660 Format CD-ROM. Submit three (3) complete sets of disks and one complete set of full size reproducible prints taken from the disks. Each disk shall have a clearly marked label stating the Contractor’s firm name, project name and location, submittal type (record) and date. Each submittal shall be accompanied by a hard copy transmittal sheet that contains the above information along with tabulated information about each file as shown below:
      | Electronic File Name | Plate Number | Drawing Title |
      a. Include electronic version of the table.
   4. Submit one copy of the CD-Rom and one set of full-size Mylar reproducibles of the drawings to (Building Records staff person) at (Post or Base).

1.04 SUBMITTAL OF FINAL RECORD DRAWINGS

A. Complete and return the final record documents and the approved preliminary record documents to the Contracting Officer within 30 calendar days of final acceptance.
   1. All drawings from the original contract documents shall be included, including drawings where no changes were made.
   2. The drawings will be returned to the Contractor if corrections are necessary.
   3. The Contractor shall make all corrections and shall return the drawings to the Contracting Officer within seven (7) calendar days of receipt.
1.05 RECORD DOCUMENT COST
   A. All costs incurred by the Contractor in the proportion and furnishing of record documents,
      including electronic file format, shall be included in the contract price and no separate payment
      will be made for this work.
      1. Approval and acceptance of the final record documents shall be accomplished before final
         payment is made to the Contractor.

1.06 SYSTEM ACCEPTANCE TESTING
   A. Provide one set of marked-up record drawings at the time of system acceptance testing. These
      record drawings shall be in addition to the submittal of marked-up record drawings specified
      elsewhere in the contract.

PART 2 – PRODUCTS (NOT USED)
PART 3 – EXECUTION (NOT USED)

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
1. Verify that the work is installed in accordance with the Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
2. Verify and document that functional performance is in accordance with the Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
4. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion.

C. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.

D. The Commissioning Authority is employed by Owner.

1.02 SCOPE OF COMMISSIONING

A. The following are to be commissioned:

B. Building envelope.

C. Plumbing Systems:
   1. Water heaters.
   2. Booster pumps.

D. HVAC System, including:
   1. Major and minor equipment items.
   2. Piping systems and equipment.
   3. Ductwork and accessories.
   4. Terminal units.
   5. Control system.
   8. Variable frequency drives.

E. Special Ventilation:
   1. Specialty fans.

F. Electrical Systems:
   1. Power quality.
   2. Emergency power systems.
   3. Uninterruptible power systems.
   4. Lighting controls other than manual switches.

G. Electronic Safety and Security:
   1. Security system, including doors and hardware.
   2. Fire and smoke alarms.

H. Communications:
   1. Voice and data systems.
2. Public addresspaging.

I. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 RELATED REQUIREMENTS

A. Section 01 65 00 - Starting of Systems: General startup requirements.
B. Section 01 77 00 - Project Closeout: Scope and procedures for operation and maintenance manuals and Owner personnel training.
C. Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC.
D. Section 23 09 23 - Direct-Digital Control System for HVAC.

1.04 REFERENCE STANDARDS

A. CSI/CSC MF - Masterformat; 2014.
B. PECI (Samples) - Sample Forms for Prefunctional Checklists and Functional Performance Tests; current edition.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority, unless they require review by Contracting Officer's Representative; in that case, submit to Contracting Officer's Representative first.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable electronic format, Microsoft Word required.
   5. As soon as possible after submittals made to Contracting Officer's Representative are approved, submit copy of approved submittal to the Commissioning Authority.
B. Product Data: If submittals to Contracting Officer's Representative do not include the following, submit copies as soon as possible:
   1. Manufacturer's product data, cut sheets, and shop drawings.
   2. Manufacturer's installation instructions.
   3. Startup, operating, and troubleshooting procedures.
   4. Fan and pump curves.
   5. Factory test reports.
   6. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.
C. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the equipment as soon as the equipment is delivered.
D. Startup Plans and Reports.
E. Completed Prefunctional Checklists.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.
B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:
   1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F and resolution of plus/minus 0.1 degree F.
2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.

3. Calibration: According to the manufacturer’s recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.

C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
   1. Dataloggers required to for Functional Tests will be provided by the Commissioning Authority and will not become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

A. Commissioning Authority will prepare the Commissioning Plan.
   1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
   2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:
   1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Authority within 60 days after award of Contract.
   2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
   3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
   4. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.02 DOCUMENTATION IDENTIFICATION SYSTEM

A. Give each submitted form or report a unique identification; use the following scheme.

B. Type of Document: Use the following prefixes:
   1. Startup Plan: SP-.
   2. Startup Report: SR-.
   3. Prefunctional Checklist: PC-.
   4. Functional Test Procedure: FTP-.
   5. Functional Test Report: FTR-.

C. System Type: Use the first 4 digits from CSI/CSC MF (Master Format), that are applicable to the system; for example:
   1. 2300: HVAC system as a whole.
   2. 2320: HVAC Piping and Pumps.
   3. 2330: HVAC Air Distribution.

D. Component Number: Assign numbers sequentially, using 1, 2, or 3 digits as required to accommodate the number of units in the system.

E. Test, Revision, or Submittal Number: Number each successive iteration sequentially, starting with 1.

F. Example: PC-2320-001.2 would be the Prefunctional Checklist for equipment item 1 in the HVAC piping system, probably a pump; this is the second, revised submittal of this checklist.
3.03 STARTUP PLANS AND REPORTS
A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.
B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.
C. Submit directly to the Commissioning Authority.

3.04 PREFUNCTIONAL CHECKLISTS
A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
   1. No sampling of identical or near-identical items is allowed.
   2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
   3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
      a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
      b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
      c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
      d. Serial number of installed unit.
      e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer's start-up checklist items and minor testing.
      f. Sensor and actuator calibration information.
   4. PECI (Samples) found at http://www.peci.org/library/mcpgs.htm indicate anticipated level of detail for Prefunctional Checklists.
B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.
   1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
   2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
   3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
   4. If any Checklist line item is not relevant, record reasons on the form.
   5. Contractor may independently perform startup inspections and/or tests, at his option.
   6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
   7. Submit completed Checklists to Commissioning Authority within two days of completion.
   8. See Section 01 70 00 - Execution and Closeout Requirements for additional general startup requirements.
C. Commissioning Authority is responsible for furnishing the Prefunctional Checklists to Contractor.
   1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in the Contract Documents.
2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in the Contract Documents or not.
4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Authority Witnessing: Required for:
   1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
   2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
   1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.

3.05 FUNCTIONAL TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.

C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
   1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents or does not perform properly.
   2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.
   3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
   4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
   5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:
   1. Some test procedures are included in the Contract Documents; where Functional Test procedures are not included in the Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.
   2. Examples of Functional Testing:
      a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.

c. Systems are run through all the HVAC control system’s sequences of operation and components are verified to be responding as the sequence’s state.

d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Authority is Functional Testing.

3. PECI (Samples) found at http://www.peci.org/library/mcpgs.htm indicated anticipated level of detail for Functional Tests.

F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

G. Factory Tests: Commissioning Authority and Contractor are responsible for coordinating testing of equipment at the factory by factory personnel, to ensure compliance with commissioning requirements.

H. Field Tests By Others: Where Functional Tests are indicated as to be performed by others not subject to the Contract Documents, those tests are not subject to these commissioning requirements.

3.06 SENSOR AND ACTUATOR CALIBRATION

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Commissioning Authority and Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate and final results.

C. All Sensors:
   1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
   2. Verify that sensors with shielded cable are grounded only at one end.
   3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
   4. Tolerances for critical applications may be tighter.

D. Sensors Without Transmitters - Standard Application:
   1. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
   2. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
   3. If not, install offset, calibrate or replace sensor.

E. Sensors With Transmitters - Standard Application.
   1. Disconnect sensor.
   2. Connect a signal generator in place of sensor.
   3. Connect ammeter in series between transmitter and building automation system control panel.
   4. Using manufacturer’s resistance-temperature data, simulate minimum desired temperature.
   5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
   6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
7. Record all values and recalibrate controller as necessary to conform with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
8. Reconnect sensor.
9. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
10. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
11. If not, replace sensor and repeat.
12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
1. Watthour, Voltage, Amperage: 1 percent of design.
2. Pressure, Air, Water, Gas: 3 percent of design.
3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F.
4. Relative Humidity: 4 percent of design.
5. Barometric Pressure: 0.1 inch of Hg.
6. Flow Rate, Air: 10 percent of design.
7. Flow Rate, Water: 4 percent of design.
8. AHU Wet Bulb and Dew Point: 2.0 degrees F.
9. Hot Water Coil and Boiler Water Temperature: 1.5 degrees F.
10. Cooling Coil, Chilled and Condenser Water Temperatures: 0.4 degrees F.
11. Combustion Flue Temperature: 5.0 degrees F.
12. Oxygen and CO2 Monitors: 0.1 percentage points.
13. CO Monitor: 0.01 percentage points.
14. Natural Gas and Oil Flow Rate: 1 percent of design.

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. Valve/Damper Stroke Setup and Check:
1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
2. Set pump/fan to normal operating mode.
3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
4. Command valve/damper to open; verify position is full open and adjust output signal as required.
5. Command valve/damper to a few intermediate positions.
6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
1. With full pressure in the system, command valve closed.
2. Use an ultra-sonic flow meter to detect flow or leakage.

3.07 TEST PROCEDURES - GENERAL
A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.
C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
2. Sampling is not allowed for:
a. Major equipment.
b. Life-safety-critical equipment.
c. Prefunctional Checklist execution.
3. \(XX\) = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
4. \(YY\) = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
5. Randomly test at least \(XX\) percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
6. If \(YY\) percent of the units in the first sample fail, test another \(XX\) percent of the remaining identical units.
7. If \(YY\) percent of the units in the second sample fail, test all remaining identical units.
8. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.

D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the "observation").

E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.

F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.

G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.

H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.

I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:
   1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Authority’s request, Contractor shall trend up to 20 percent more points than specified at no extra charge.
   2. Other points will be monitored by the Commissioning Authority using dataloggers.
   3. At the option of the Commissioning Authority, some control system monitoring may be replaced with datalogger monitoring.
   4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.
   5. Graphical output is desirable and is required for all output if the system can produce it.
   6. Monitoring may be used to augment manual testing.

3.08 OPERATION AND MAINTENANCE MANUALS

A. See Section 01 77 00 - Project Closeout for additional requirements.

B. See Section 01 78 39 - Project Record Documents for additional requirements.

C. Add design intent documentation furnished by Contracting Officer's Representative to manuals prior to submission to Owner.

D. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.
E. Commissioning Authority will add commissioning records to manuals after submission to Owner.

END OF SECTION
SECTION 02 41 16
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Demolition and removal of selected portions of a building.
B. Demolition and removal of selected site elements.
C. Removal of selected interior finishes in areas to be modernized.
D. Patching and repairs.
E. Salvage existing items to be reused or recycled.
F. Work by Others: Elements of selective demolition will be accomplished by EXCHANGE under separate contracts:
   1. Retail display fixture removal/relocation.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Use of the building and phasing requirements.
B. Section 01 14 50 - Cutting and Patching.
C. Section 01 32 00 - Construction Progress Documentation.
D. Section 01 50 00 - Temporary Facilities and Controls: Temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures for selective demolition operations.
E. Section 07 01 50 - Maintenance of Membrane Roofing.
F. Division 21 Sections for cutting, patching, or relocating Fire Sprinkler items.
G. Division 22 Sections for cutting, patching, or relocating Plumbing items.
H. Division 23 Sections for cutting, patching, or relocating HVAC items.
I. Division 26 Sections for cutting, patching, or relocating Electrical items.

1.03 DEFINITIONS

A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain EXCHANGE property.
B. Remove and Salvage: Items indicated to be removed and salvaged remain EXCHANGE property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to EXCHANGE's designated storage area.
C. Remove and Reinstall: Remove items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in the same locations or in locations indicated.
D. Existing to Remain: Protect construction indicated to remain against damage during selective demolition. When permitted by the Contracting Officer, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

1.04 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain EXCHANGE property, demolished materials shall become the Contractor's property and shall be removed from the site and legally disposed of off Installation.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Schedule of selective demolition activities indicating the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.
2. Interruption of utility services.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Detailed sequence of selective demolition and removal work to ensure uninterrupted progress of \textit{EXCHANGE}'s on-site operations.
5. Coordination of \textit{EXCHANGE}'s continuing occupancy of portions of existing building and of \textit{EXCHANGE}'s partial occupancy of completed Work.

C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by selective demolition operations.
   1. Refer to Section 01 32 00 for further requirements.

D. Record drawings at Project close-out according to Section 01 78 39 - Project Record Documents.
   1. Identify and accurately locate capped utilities and other subsurface structural, electrical, or mechanical conditions.

\textbf{1.06 PROJECT CONDITIONS}

A. \textit{EXCHANGE} will occupy portions of the building immediately adjacent to selective demolition area. Conduct selective demolition so that \textit{EXCHANGE}'s operations will not be disrupted. Provide not less than 72 hours' notice to \textit{EXCHANGE} of activities that will affect \textit{EXCHANGE}'s operations.

B. \textit{EXCHANGE} assumes no responsibility for actual condition of buildings to be selectively demolished.
   1. Conditions existing at time of inspection for bidding purpose will be maintained by \textit{EXCHANGE} as far as practical.

C. Provide secure temporary closure at exterior wall openings where existing infills are removed or new openings created.

D. Where existing opening infills in the retail sales area are scheduled for demolition, maintain interior wall furring and finishes.

\textbf{PART 2 - PRODUCTS}

\textbf{2.01 REPAIR MATERIALS}

A. Use repair materials identical to existing materials.
   1. Where identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
   2. Use materials whose installed performance equals or surpasses that of existing materials.

\textbf{PART 3 - EXECUTION}

\textbf{3.01 EXAMINATION}

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with the intended function or design are encountered, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Contracting Officer.

D. Survey the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.

E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
3.02 UTILITY SERVICES

A. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by EXCHANGE and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to EXCHANGE and to governing authorities.
      a. Provide not less than 72 hours notice to EXCHANGE if shutdown of service is required during changeover.

B. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services serving building to be selectively demolished.
   1. Arrange to shut off indicated utilities with utility companies.
   2. Where utility services are required to be removed, relocated, or abandoned, provide bypass connections to maintain continuity of service to other parts of the building before proceeding with selective demolition.
   3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal the remaining portion of pipe or conduit after bypassing.

C. Utility Requirements: Refer to Divisions 21, 22, 23, and 26 Sections for shutting off, disconnecting, removing, and sealing or capping utility services. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.03 PREPARATION

A. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

B. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from EXCHANGE and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around selective demolition area.
   1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
   2. Protect existing site improvements, appurtenances, and landscaping to remain.
   3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
   4. Provide temporary weather protection, during interval between demolition and removal of existing construction, on exterior surfaces and new construction to ensure that no water leakage or damage occurs to structure or interior areas.
   5. Protect walls, ceilings, floors, and other existing finish work that are to remain and are exposed during selective demolition operations.
   6. Cover and protect furniture, furnishings, and equipment that have not been removed.

D. Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
   1. Construct dustproof partitions of not less than nominal 4-inch studs, 5/8-inch gypsum wallboard with joints taped on occupied side, and 1/2-inch fire-retardant plywood on the demolition side.
   2. Insulate partition to provide noise protection to occupied areas.
   3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
   4. Protect air-handling equipment.
   5. Weatherstrip openings.
E. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of building to be selectively demolished.
   1. Strengthen or add new supports when required during progress of selective demolition.

3.04 POLLUTION CONTROLS
A. Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations.
   1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
B. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.
C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before start of selective demolition.

3.05 SELECTIVE DEMOLITION
A. Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. To minimize disturbance of adjacent surfaces, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
   2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
   4. Maintain adequate ventilation when using cutting torches.
   5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   6. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
   7. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   8. Dispose of demolished items and materials promptly. On-site storage or sale of removed items is prohibited.
   9. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.
B. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain, using power-driven masonry saw or hand tools; do not use power-driven impact tools.
C. Break up and remove concrete slabs on grade, unless otherwise shown to remain.
D. Remove resilient floor coverings and adhesive according to recommendations of the Resilient Floor Covering Institute's (RFCI) "Recommended Work Practices for the Removal of Resilient Floor Coverings" and Addendum.
   1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.
E. Remove air-conditioning equipment without releasing refrigerants.
3.06 PATCHING AND REPAIRS
   A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by
      selective demolition operations.
   B. Patching is specified in Section 01 14 50 - Cutting and Patching.
   C. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new
      materials.
   D. Restore exposed finishes of patched areas and extend finish restoration into adjoining
      construction to remain in a manner that eliminates evidence of patching and refinishing.
   E. Patch and repair floor and wall surfaces in the new space where demolished walls or partitions
      extend one finished area into another. Provide a flush and even surface of uniform color and
      appearance.
      1. Closely match texture and finish of existing adjacent surface.
      2. Patch with durable seams that are as invisible as possible. Comply with specified
         tolerances.
      3. Where patching smooth painted surfaces, extend final paint coat over entire unbroken
         surface containing the patch after the surface has received primer and second coat.
      4. Remove existing floor and wall coverings and replace with new materials, if necessary, to
         achieve uniform color and appearance.
      5. Inspect and test patched areas to demonstrate integrity of the installation, where feasible.
   F. Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of
      uniform appearance.
   G. Patch and repair roof decks and roof membrane systems caused by selective demolition
      operations.
      1. Refer to Section 07 01 50 - Maintenance of Membrane Roofing, regarding protection of
         and modifications to existing roofing systems.

3.07 DISPOSAL OF DEMOLISHED MATERIALS
   A. General: Promptly dispose of demolished materials. Do not allow demolished materials to
      accumulate on-site.
   B. Burning: Do not burn demolished materials.
   C. Disposal: Transport demolished materials off EXCHANGE's property and legally dispose of
      them. Dispose all contaminated materials to an approved disposal site.

3.08 CLEANING
   A. Sweep the building broom clean on completion of selective demolition operation.
   B. Change filters on air-handling equipment on completion of selective demolition operations.

END OF SECTION
SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. This Section specifies cast-in-place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.

1.02 RELATED REQUIREMENTS
A. Section 01 14 50 - Cutting and Patching.
B. Section 03 35 36 - Polished Concrete Floor Finish.
C. Section 03 35 40 - Interior Concrete Slab Repairs and Joint Filler Replacement.
D. Section 31 31 16 - Termite Control: Soil treatment beneath new slabs on grade.
E. Section 32 13 00 - Concrete Paving.

1.03 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: For proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, underslab vapor barriers, curing compounds, dry-shake finish materials, and others as requested by Contracting Officer.
C. Shop drawings for reinforcement for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66 (88), "ACI Detailing Manual", showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures. All wall reinforcement must be shown in elevation.
D. Samples of materials as requested by Contracting Officer, including names, sources, and descriptions.
E. Laboratory test reports for concrete materials and mix design test.
F. Materials certificates in lieu of materials laboratory test reports when permitted by Contracting Officer. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.04 QUALITY ASSURANCE
A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
   1. ACI 318, "Building Code Requirements for Reinforced Concrete."
   2. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
   3. ACI 301 "Specifications for Structural Concrete for Buildings."
B. Concrete Testing Service: Engage a testing laboratory acceptable to Contracting Officer to perform material evaluation tests for submittal.
C. EXCHANGE will engage and pay a testing lab to control testing during construction.
D. Materials and installed work may require testing and retesting at any time during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense. Allow free access to material stockpiles and facilities.

PART 2 - PRODUCTS

2.01 FORM MATERIALS
A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system
shown on drawings. Provide panel with sufficient thickness to withstand pressure of newly-placed concrete without how or deflection.
1. Use exterior grade plywood complying with U.S. Product Standard PS-1 Medium Density Overlay, Class 1 or better, mill-oiled and edge-sealed.
2. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
3. Form Coatings: Provide commercial formulation form-coating compounds with a maximum VOC of 350 mg/l that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
4. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to exposed surface.
   a. Provide ties that, when removed, will leave holes not larger than 1 inch diameter in concrete surface.

2.02 REINFORCING MATERIALS
A. Reinforcing Bars: ASTM A615, Grade 60, deformed for #4 and larger bars. ASTM A615, Grade 40, deformed for #3 bars.
B. Steel Wire: ASTM A82, plain, cold-drawn steel.
D. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.
   1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
E. Rebar Dowel Anchoring Epoxy: Quikrete High Strength Anchoring Epoxy: www.quikrete.com; or approved equivalent.

2.03 CONCRETE MATERIALS
A. Portland Cement: ASTM C150, Type I or Type II.
   1. Use one brand of cement throughout project.
B. Normal-Weight Aggregates: ASTM C33 and as herein specified. Provide aggregates from a single source for exposed concrete.
   1. For exposed exterior surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
   2. Local aggregates not complying with ASTM C33 but that special tests or actual service have shown to produce concrete of adequate strength and durability may be used when acceptable to Contracting Officer.
C. Water: Potable.
D. Admixtures, General: Provide admixtures for concrete that contain not more than 0.1 percent chloride ions. Calcium chloride is not acceptable. Provide admixture manufacturer's written certification that chloride ion content complies with specific requirements.
E. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.
   1. Products: Subject to compliance with requirements, provide one of the following:
      b. "Air-Mix" or "Perma-Air", Euclid Chemical Co.
      c. "Darex AEA" or "Daravair", W.R. Grace & Co.
      d. "MB-VR" or "Micro-Air", Master Builders, Inc.
      f. "Sika AER", Sika Corp.
F. Water-Reducing Admixture: ASTM C494, Type A.
   1. Products: Subject to compliance with requirements, provide one of the following:
b. "PSI N", Cormix.
c. "Eucon WR-75", Euclid Chemical Co.
e. "Pozzolith Normal" or "Polyheed", Master Builders, Inc.
g. "Plastocrete 161", Sika Corp.

G. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C494, Type F or Type G.
1. Products: Subject to compliance with requirements, provide one of the following:
   b. "PSI Super", Cormix.
   c. "Eucon 37", Euclid Chemical Co.
   d. "WRDA 19" or "Daracem", W.R. Grace & Co.
   e. "Rheobuild", Master Builders, Inc.
   g. "Silkament 300", Sika Corp.

H. Water-Reducing, Accelerating Admixture: ASTM C494, Type E.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. "Q-Set", Conspec Marketing & Manufacturing Co.
   b. "Gilco Accelerator", Cormix.
   c. "Accelguard 80", Euclid Chemical Co.
   e. "Pozzutec 20", Master Builders, Inc.

I. Water-Reducing, Retarding Admixture: ASTM C494, Type D.
1. Products: Subject to compliance with requirements, provide one of the following:
   b. "Eucon Retarder 75", Euclid Chemical Co.
   d. "Pozzolith R", Master Builders, Inc.
   e. "Protard", Prokrete Industries.

2.04 RELATED MATERIALS

1. Graded in accordance with ASTM C136, within the following limits:
   b. Maximum Size: 5/8 inch.

B. Underslab Vapor Barrier: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
1. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor barrier.
2. Products:
C. Moisture-Retaining Cover: One of the following, complying with ASTM C171.
   1. Waterproof paper.
   2. Polyethylene film.
   3. Polyethylene-coated burlap.

D. Cure and Seal Compound: Typical concrete slab liquid membrane forming curing compound to be "Ashford Formula", Concrete Distribution, Inc., 1203 W. Spring Creek Place, Springville UT 84663 (801-489-5663) approximately 200 square feet per gallon in locations not receiving polished concrete floor finish.

2.05 BONDING PRODUCTS

A. Epoxy Bonding System: Complying with ASTM C881/C881M and of Type required for specific application.
   1. Locations for Use:
      a. Bonding fresh concrete to hardened concrete.
   2. Products:

2.06 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Contracting Officer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

B. Slabs on Grade: It is the intent of the design that slabs on grade receive special attention for mix design. The submitted slab mix design is to incorporate proportioning to minimize paste content (minimize total water content) and provide a well-graded aggregate with maximum aggregate size (1-inch preferred). Gap graded mixes with primarily 3/4-inch aggregate and sand will not be allowed.

C. Submit written reports to Contracting Officer for each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Contracting Officer.

D. Design mixes to provide normal weight concrete properties as follows, except where higher strength is noted on the drawings or in the specifications:
   1. Minimum Compressive Strength: 4000 psi, when tested in accordance with ASTM C39/C39M at 28 days.
   2. Water/Cement Ratio: Maximum 50 percent by weight.
   3. Total Air Content: 2 to 4 percent typical, except 5 to 7 percent for concrete exposed to freeze-thaw cycles, determined in accordance with ASTM C173/C173M.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Contracting Officer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Contracting Officer before using in Work.

2.07 ADMIXTURES

A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

B. Use nonchloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F.
C. Use high-range water-reducing admixture (HRWR) in pumped concrete, concrete for industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water/cement ratios below 0.50.

D. Use air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content within ranges indicated.

E. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.

2.08 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements of ASTM C94, and as specified.
   1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

2.09 REPAIR MATERIALS

A. Repair Underlayment Beneath Floor Finishes: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8- to 1/4-inch or coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C109M.

B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4-inch.
   1. Cement Binder: ASTM C150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.
   2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8- to 1/4-inch or coarse sand as recommended by topping manufacturer.
   4. Compressive Strength: Not less than 5700 psi at 28 days when tested according to ASTM C109/C109M.

2.10 CONCRETE TYPES (INTERIOR AND EXTERIOR SLABS):

A. As indicated, provide concrete of specified strengths and mix designs with the following appearance characteristics:
   2. Portland cement, broom finish, exterior.

PART 3 - EXECUTION

3.01 GENERAL

A. Coordinate the installation of joint materials and underslab vapor barriers with placement of forms and reinforcing steel.

3.02 FORMS

A. General: Design, erect, support, brace, and maintain formwork to support vertical and lateral, static and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances complying with ACI 347.

B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings,
offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking,
screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use
selected materials to obtain required finishes. Solidly butt joints and provide backup at joints
to prevent leakage of cement paste.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces.
Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom
forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy
removal.

D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for
inspection before concrete placement, and for placement of concrete. Securely brace
temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate
temporary openings in forms at inconspicuous locations.

E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer
strips fabricated to produce uniform smooth lines and tight edge joints.

F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of
other trades. Determine size and location of openings, recesses, and chases from trades
providing such items. Accurately place and securely support items built into forms.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete.
Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retighten
forms and bracing before concrete placement, as required, to prevent mortar leaks and
maintain proper alignment.

3.03 PLACING REINFORCEMENT

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing
Reinforcing Bars," for details and methods of reinforcement placement and supports and as
herein specified.

1. Avoiding cutting or puncturing underslab vapor barrier during reinforcement placement and
concreting operations.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or
destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and
support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by
Contracting Officer.

D. Place reinforcement to maintain at least minimum coverages for concrete protection. Arrange,
space, and securely tie bars and bar supports to hold reinforcement in position during concrete
placement operations. Set wire ties so ends are directed into concrete, not toward exposed
concrete surfaces.

E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full
mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in
either direction.

F. When repairing concrete slabs that have been trenched, or where new concrete slabs abut
existing concrete slabs, dowel existing concrete slabs to new concrete. Drill minimum 4 inch
deep holes into edges of existing concrete slab at 16 inches on center maximum, and anchor
#3 rebar dowels in holes with epoxy adhesive.

3.04 JOINTS

A. Construction Joints: Locate and install construction joints as indicated on the structural
drawings or, if not indicated, locate so as not to impair strength and appearance of the structure,
as acceptable to Contracting Officer.

B. Provide keyways at least 1-1/2-inches deep in construction joints in walls and slabs and
between walls and footings. Accepted bulkheads designed for this purpose may be used for
slabs.
C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.

D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

E. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere, as indicated.
   1. Joint filler and sealant materials are specified in Section 07 92 00 - Joint Sealants.

F. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use saw cuts 1/8-inch wide by one-fourth slab depth.
   1. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate. Joints MUST be made within 6 hours of finishing floors, and in no case shall cuts be made later than 12 hours from placement.
   2. Apply joint sealant to all exposed contraction joints. Color selected to match adjacent surface. Joint sealant material is specified in Section 07 92 00 - Joint Sealants.

3.05 INSTALLATION OF EMBEDDED ITEMS
A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.

B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to obtain required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.06 UNDERSLAB VAPOR BARRIER
A. Interior Slabs on Grade: Install vapor barrier under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor barrier before covering.
   1. Vapor Barrier Over Granular Fill: Install compactible granular fill before placing vapor barrier as shown on the drawings. Do not use sand.
   2. Installation: Comply with ASTM E1643.

3.07 PREPARATION OF FORM SURFACES
A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions. Clean reused forms of concrete residue, repair and patch as required to return forms to acceptable surface condition.

C. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.08 CONCRETE PLACEMENT
A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.

B. General: Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.

C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete that has hardened sufficiently to cause the formation of seams or planes of weakness.
If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
   1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
   2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
   1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
   3. Maintain reinforcing in proper position on chairs during concrete placement.

F. Hot-Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
   1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F. Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
   2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
   3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete.
   4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, when acceptable to Contracting Officer.

G. Cold-Weather Placing: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
      a. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
      b. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

3.09 FINISH OF FORMED-surfaces

A. Rough-Form Finish: For formed concrete surfaces not exposed to view in the finish Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4-inch in height rubbed down or chipped off.

B. Smooth-Form Finish: For formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This
is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 MONOLITHIC SLAB FINISHES

A. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified:

1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of overall minimum Ff 35-Ff 25 with local minimum Ff 21-Ff 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

B. Trowel Finish: Apply a trowel finish to monolithic slab surfaces to be exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film-finish coating system.

1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of Ff20 - FI 17. Grind smooth any surface defects that would telegraph through applied floor covering system, including edge curling at joints.

3.11 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

C. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.

1. Provide moisture curing by following methods:
   a. Keep concrete surface continuously wet by covering with water.
   b. Use continuous water-fog spray.
   c. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4-inch lap over adjacent absorptive covers.
   d. Provide moisture-cover curing as follows:
      1) Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   e. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs as follows:
      1) Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or
roller in accordance with manufacturer’s directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

2) Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

D. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

E. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces, by application of appropriate curing method.

F. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

3.12 REMOVAL OF FORMS
A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

3.13 REUSE OF FORMS
A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use “patched” forms for exposed concrete surfaces except as acceptable to Contracting Officer.

3.14 MISCELLANEOUS CONCRETE ITEMS
A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment. Grout base plates and foundations as indicated using specified non-shrink grout. Use non-metallic grout for exposed conditions.

3.15 CONCRETE SURFACE REPAIRS
A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Contracting Officer.

1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar before bonding compound has dried.

2. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Contracting Officer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent.
   1. Repair concealed formed surfaces, where possible, that contain defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

C. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.
   1. Repair finished unformed surfaces that contain defects that affect the concrete's durability. Surface defects, as such, include crazing and cracks in excess of 0.01-inch wide or that penetrate to reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
   2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
   3. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Proprietary underlayment compounds may be used when acceptable to Contracting Officer.
   4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
   5. Correct low areas in existing slab by scarifying surface, priming and finishing with patching compound blended into adjacent concrete.

D. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry-pack before bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

E. Perform structural repairs with prior approval of Contracting Officer for method and procedure, using specified epoxy adhesive and mortar.

F. Repair methods not specified above may be used, subject to acceptance of Contracting Officer.

3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General: EXCHANGE will employ a testing laboratory to perform tests and to submit test reports.

B. Sampling and testing for quality control during concrete placement may include the following, as directed by Contracting Officer.

C. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
   1. Slump: ASTM C143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
   2. Air Content: ASTM C173, volumetric method for lightweight or normal weight concrete; ASTM C231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
3. Concrete Temperature: Test hourly when air temperature is 40 deg F and below, when 80 deg F and above, and each time a set of compression test specimens is made.

4. Compression Test Specimen: ASTM C31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.

5. Compressive-Strength Tests: ASTM C39; at least one set for each day's pour, or not less than once for each 150 cubic yards of concrete, or not less than once for each 5,000 SF of surface area for slabs or walls; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
   a. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
   b. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
   c. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

D. Test results will be reported in writing to Contracting Officer, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

F. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Contracting Officer. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.

END OF SECTION
SECTION 03 35 36
POLISHED CONCRETE FLOOR FINISH

PART 1  GENERAL

1.01  SECTION INCLUDES

   A.  Installation of polished concrete floor system for existing interior concrete floors by dry grinding, application of concrete densifier, and polishing with various size grit metal-bonded and resin-bonded diamonds to the scheduled specified minimum local and overall gloss values.

   B.  Removal of existing epoxy, ceramic, carpet, and/or vinyl composite tile floor finish, and all underlayment products where shown on drawings.

   C.  Application of chemical dye and complementary edge band treatment.

1.02  RELATED SECTIONS

   A.  Section 03 30 00 - Cast-in-Place Concrete.

   B.  Section 03 35 40 - Interior Concrete Slab Repairs and Joint Filler Replacement.

   C.  Division 09 - Finishes.

1.03  REFERENCES


1.04  SUBMITTALS

   A.  See Section 01 33 00 - Submittals, for submittal procedures.

   B.  Product Data:

      1.  Provide manufacturer's equipment product data sheets for:

         a.  Planetary grinder polishing equipment.

         b.  Planetary grinder HEPA dust collection equipment.

         c.  Hand tools.

         d.  Hand tool dust collection equipment.

         e.  Diamond tooling.

         f.  High speed propane burnisher.

         g.  Polyurea pump.

         h.  Joint cutting saw.

      2.  Manufacturer's chemical and product data sheets for:

         a.  Liquid reactive surface densifier.

         b.  Liquid stain guard treatment.

         c.  Joint filler.

         d.  Crack and spall repair product.

         e.  Self leveling, dye-able, polishable overlay product.

         f.  Grout coat, pin hole and small defect surface treatment.

   C.  Installer’s Certification:

      1.  Provide list of 5 projects performed within last three years of similar type, size and complexity. Submit project names, addresses, contacts and phone numbers for each project. General Contractor is to validate references and polisher’s capabilities prior to submitting bid to EXCHANGE.

      2.  Applicator Qualifications: Submit letter of certification from each of the following manufacturers of products and equipment specified herein, stating that the applicator is a certified applicator of the system and is familiar with proper procedures and installation methods as required by the manufacturer.

         a.  Planetary grinder system.

         b.  Liquid reactive surface densifier and stain guard treatment.

         c.  Joint filler, crack and spall repair products.

   D.  Pre-Certified Installers
1. All bidding contractors must have completed our in house certification for this project. Below is a list of pre-approved applicators.

<table>
<thead>
<tr>
<th>COMPANY NAME</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. American Concrete Inc.</td>
<td>877-775-0030</td>
</tr>
<tr>
<td>b. Avalon Corporation</td>
<td>425-643-5667</td>
</tr>
<tr>
<td>c. Bomanite of North Texas</td>
<td>800-492-2524</td>
</tr>
<tr>
<td>d. Budget Maintenance Concrete</td>
<td>610-323-7702</td>
</tr>
<tr>
<td>e. Diama-Shield</td>
<td>888-730-4075</td>
</tr>
<tr>
<td>f. Jeffco Concrete Contractors</td>
<td>800-226-2668</td>
</tr>
<tr>
<td>g. K &amp; J Concrete Polishing</td>
<td>865-971-1760</td>
</tr>
<tr>
<td>h. Pacific Decorative Concrete</td>
<td>916-725-9269</td>
</tr>
<tr>
<td>i. Perfect Polish Inc.</td>
<td>877-917-4463</td>
</tr>
<tr>
<td>j. Stone Care of Texas</td>
<td>210-656-8019</td>
</tr>
</tbody>
</table>

2. **Refer to Specifications Division 00 for substitution qualifications. Any potential Contractor substitution must have their complete submittal package submitted in writing through a General Contractor a **minimum of 10 days** prior to bid date to the EXCHANGE Contracting Officer for review and approval.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Accessibility Requirements: Comply with applicable requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAGs) for Buildings and Facilities; Final Guidelines, revisions, and updates for static coefficient of friction for walkway surfaces.
   2. Environmental Requirements: Comply with current Federal and local toxicity and air quality regulations and with Federal requirements on content of lead, mercury, and other heavy metals. Do not use solvents in floor polish products that contribute to air pollution or impact food quality.

B. Pre-installation Meeting:
   1. General contractor shall schedule and convene a pre-installation meeting at the project site before start of installation of polished concrete floor system.
   2. Meeting to occur only after review and approval of required Sub-contractor submittals and completion of test panel mock-up, including specified grinding, polishing and dye, joint filling, spall and crack repairs, and specified overall gloss values.
   3. Require attendance of parties directly affecting work of this section, including:
      a. EXCHANGE Project Manager.
      b. EXCHANGE Store Manager of Assistant Manager.
      c. Project Architect.
      d. Owner’s Polishing Consultant.
      e. General Contractor.
      f. Polishing Subcontractor including Project Manager and Foreman.
   4. Meeting agenda to include (but not limited to): Review of existing conditions, surface preparation, system installations, field quality control, protection, environmental requirements, coordination with other work, controls to limit damage from dust and field quality control methods and reporting.

1.06 MOCK-UP

A. Provide polished concrete floor finish mock-up, a minimum of 250 square feet, illustrating completed finish including dye, all specified liquid surface treatments and specified gloss levels.
   1. Mock-up will include proper joint treatment and correctly prepared surface spalls and slab edge treatments per specification section 03 35 40.
   2. Half of the sample area should include completed stain protection application and half should be without stain protection for testing purposes.
   3. The sample should also include edge finishing treatments for the purpose of review per specifications.

B. Locate mock-up where directed by EXCHANGE Project Manager.
C. Accepted mock-up will serve as standard to judge quality and workmanship of completed polished concrete floor finish.
D. Accepted mock-up shall remain as part of finished product.

1.07 PROJECT CONDITIONS
A. Sequence application of concrete polishing after completion of other construction activities that would be damaging to the completed polished concrete finish.
B. Close areas to traffic during and after floor application for time period recommended in writing by manufacturer.

PART 2 PRODUCTS AND EQUIPMENT

2.01 EQUIPMENT TO BE USED FOR INSTALLATION
A. Floor Grinder:
   1. Machinery manufacturer will be HTC, SASE, Concrete Polishing Solutions, Husqvarna, Diamatic or PrepMaster.
   2. Type: Multi-orbital, planetary-action, opposing-rotational, 3 or 4 diamond-headed floor grinders.
   3. Weight: 850 pounds or more.
B. Dust Extraction System and pre-separator for grinding/polishing:
   1. Heavy-duty industrial HEPA filtration vacuum system, suitable for extracting and containing large quantities of fine concrete dust (minimum 350 CFM air flow) in conjunction with manufacturer recommended pre-separator:
      a. HTC 86D.
      b. Pullman-Ermator T8600.
      c. SASE Bull 1250.
      d. Approved equal.
C. Diamond Tooling for Coating Removal, Initial Grinding, and Preparing Floor for Polishing:
   1. Metal Bonded Diamonds.
      a. Grit Size: 40, 80, and 150.
      b. Reference Section 3.3C.
D. Diamond Tooling for Polishing Concrete:
   1. Resin Bonded, Phenolic Diamonds.
      a. Grit Size: 100, 200, 400, 800 and 1500 or equivalent.
E. Grinding / Polishing Pads for Edges:
   1. Grit Size: 80, 100, 120, 200, 400, 800, 1500 and 3000.
F. Hand Grinder with dust extraction attachment and pads.
G. Joint cutting saw with dust extraction attachment:
   1. The Mongoose, by Engrave-a-Crete.
   3. Hump Back, by Joe Due.
H. Self-propelled shaver/leveler for slab surface demolition and leveling:
   1. ShaveMaster, by VIC International Corporation.
   2. SuperShaver, by CPS.
   3. BMC 335 Shaver, by Diamatic.
I. High speed propane burnisher:
   1. Minimum 27 inch head generating pad speeds of 2,500 RPM or higher.
J. Diamond Impregnated Burnisher Pads:
   1. Twister Diamond Cleaning System Pads, by HTC.
   3. SpinFlex Diamond Polishing Pads, by CPS.
2.02 MATERIALS

A. Penetrating Hardener/Densifier: Clear liquid reactive lithium-silicate based:
   2. RetroPlate 99 by Advanced Floor Products.
   3. FGS Permashine by L&M Construction Chemicals.
   4. SureLock Densifier by Ameripolish.
   5. Substitutions by Approval Only.
   6. No substitutions.

B. Protective Surface Treatment (Stain Guard):
   1. Consolideck LS Guard, by Prosoco.
   2. RetroGuard by Advanced Floor Products.
   3. FGS Stain Protection by L&M Construction Chemicals.
   5. No substitutions.

C. Solvent Based dye (where needed for repairs or per plans):
   1. AmeriPolish Acetone Solvent Based Dye.
   2. Prosoco GemTone Dye (Applied with Acetone ONLY).

D. Joint Filler:
   1. SL/65 Polyurea in complementary darker color to match Dyed Polished Concrete, by VersaFlex Incorporated.
   2. RS65 Polyurea in complementary darker color to match Dyed Polished Concrete, by Metzger McGuire.
   3. HT-PE65 Polyurea in complementary darker color to match Dyed Polished Concrete, by Hi-Tech Systems.
   4. Colors to be matched as closely as possible using a chip set match provided by the Owner's polishing consultant. Manufacturer to produce product to match this color selection.

E. Low Viscosity Crack and Spall Repair:
   2. HT Spall-FX2 in complementary matching color, by Hi-Tech Systems.
   3. Quick-Mender in complementary matching color, by VersaFlex Incorporated.
   4. 10 Minute Mender or Matchcrete in complementary color, by Roadware.
   5. Colors to be reviewed and approved by EXCHANGE Manager or Polished Concrete Consultant in mock-up.

F. Wide Area Surface Repairs:
   1. TRU Self Leveling, by CTS Cement Manufacturing Corporation.
   2. Diama-Top by Ardex Engineered Cements.
   3. Color after application of Specified Dye to be reviewed and approved by EXCHANGE Project Manager or Polished Concrete Consultant in mock-up

G. Pin Hole and Surface Pitting Grout Coat:
   1. GM 3000, by Husqvarna Construction Products.
   2. StarSeal Fusion, by Vexcon Chemicals, Inc.
   3. Diama-Fill, by Ardex Engineered Cements.
   4. Approved Equal.
   5. Color after application to be reviewed and approved by EXCHANGE Project Manager or Polished Concrete Consultant in mock-up.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine floor to receive polished concrete floor system.
B. Notify the Project Manager of conditions that would adversely affect installation or subsequent use prior to commencement of polishing.
C. Do not begin surface preparation or installation until conditions are corrected and approved.

### 3.02 SURFACE PREPARATION

A. Protection: Protect surrounding areas and adjacent surfaces from the following:
   1. Minimal accumulation of dust from grinding and polishing.
   2. Contact with overspray of penetrating hardener / densifier.
   3. Contact with overspray of protective surface treatment (stain guard).
   4. Contact with joint filler, crack or spall repair materials.
B. On existing concrete floors, completely remove existing flooring, mastics, adhesives, self-leveling underlayment fillers and other foreign matter.
C. On existing concrete floors, remove the top 1/2 of an inch of existing joint material and replace with approval joint filler and crack repair products.
D. Clean Surfaces: Remove dirt, dust, debris, oil, grease, curing agents, bond breakers, paint, coatings, and other surface contaminants which adversely affect installation of polished concrete floor system.
E. Fill concrete joints in accordance with Section 07 90 05.
F. Repair all slab defects and joints in accordance with Section 03 35 40.

### 3.03 INSTALLATION

A. Install polished concrete floor system in accordance with manufacturer’s instructions at locations indicated on the Drawings.
B. Aggregate Exposure:
C. Polished Concrete Floor System
   1. Open Slab Surface:
      a. As required to provide a uniform final polish or removal of existing floor coatings, begin grinding with 40 or 80-grit metal bond. Bids shall be based on starting initial cut with 40-grit metal diamonds. Expose coarse concrete aggregate when required to reach lows spots within floor surface.
      b. Review condition of floor with EXCHANGE Project Manager. Obtain approval from EXCHANGE Project Manager if large coarse aggregate is required to be exposed to remove existing coatings, floor underlayment or slab deficiencies. Variations to the precise grinding, densifying, polishing and stain guard application are anticipated, but must be discussed and approved in writing by the EXCHANGE Project Manager prior to executing the work.
      c. For new concrete floors, open-up concrete by grinding with 80-grit metal-bonded.
      d. Progressive edge grinding will be necessary within 1/2” of all vertical abutments, including walls, cases, columns, posts and racking systems.
      e. Joint filler shall be flush with surface after grinding and polishing steps. Additional passes along curled joints may be necessary to even the surfaces and remove joint filler chatter.
   2. Remove metal-bonded diamond scratches by grinding with progressively finer metal-bonded diamonds, up to metal bond 150-grit.
   3. Apply densifier:
      a. Apply to the point of rejection to ensure complete acceptance of the densifier product at the recommended step per manufacturer’s recommendations.
   4. Floor Polishing:
      a. Remove 150-grit metal-bonded diamond scratches by grinding with a transitional diamond per manufacturers recommendation
      b. Remove transitional resin-bonded diamond scratches by grinding with 100-grit resin-bonded diamonds.
c. Remove 100-grit resin-bonded diamond scratches by grinding with 200-grit resin-bonded diamonds.
d. Remove 200-grit resin-bonded diamond scratches by grinding with 400-grit resin-bonded diamonds.
e. Remove 400-grit resin-bonded diamond scratches by grinding with 800-grit resin-bonded diamonds.
f. Remove 800-grit resin-bonded diamond scratches by grinding with 1500-grit resin-bonded diamonds.

5. Apply stain guard:
   a. Apply in accordance with manufacturer’s published instructions.
   b. Apply first coat per manufacturer’s recommendation (DO NOT OVER APPLY).
   c. Use applicator pad, pre-wetted with stain guard, to pull material out to create a thin film prior to drying.
   d. Remove product completely from areas of over application, as evidenced by surface streaking, and replace with unused stain guard.
   e. Apply second coat of stain guard at all high traffic areas identified on the drawings per manufacturers instructions.

6. High speed burnish:
   a. After each application of stain guard is dry, burnish surface.
   b. Burnish using approved pads, at a slow movement pace using high speed machine with 400 or 800 grit diamond impregnated pads as required to achieve specified gloss requirements.
   c. Burnish with several passes. Make each progressive pass at 90 degrees from previous pass.
   d. Burnishing, pad type, and pace of forward movement shall combine to develop a minimum floor surface temperature of 91-degrees F directly below the burnishing pad as continuously measured by the operator during installation.

D. Penetrating Dye:
   1. Mix dye in accordance with manufacturer’s instructions for use in blending and matching patches.

E. Design Standards are to be as follows:
   1. Main Stores: Polish existing concrete with no color unless specifically called out in specifications or plans.

3.04 FIELD QUALITY CONTROL

A. Inspect completed polished concrete floor system with the Concrete Consultant, Contractor, and Installer.

B. Review procedures with Contracting Officer to correct unacceptable areas of completed polished concrete floor system.

C. Specular Gloss/Reflectance, ASTM D523:
   1. Perform polishing and burnishing work necessary to produce a Specified Overall Gloss Value (SOGV) > 50 prior to applying protective surface treatment, SOGV > 60 after applying protective surface treatment, Minimum Local Gloss Value (MLGV) > 40 after applying protective surface treatment as measured using a Horiba IG-320 60 Degree Gloss Checker.
   2. Gloss shall be considered as a quantitative value that expresses the degree of reflection when light hits the concrete floor surface. Gloss measurements will be taken independent of ambient lighting and will be taken within a sealed measurement window located beneath the test unit.
   3. Collect 12 readings minimum, throw out low and high measurements and average remaining measurements. Average shall exceed SOGV. No single measurement shall be less than MLGV.

3.05 PROTECTION

A. Protect completed polished concrete floor system from damage until Substantial Completion.
1. Do not allow vehicle and pedestrian traffic on unprotected floor.
2. Do not allow construction materials, equipment, and tools on unprotected floor.
4. If construction equipment must be used for application, diaper components that might drip oil, hydraulic fluid, or other liquids.
5. No tire embedments (rocks, nails, screws, etc.) that will scratch or pit slab surface.
6. Prohibit pipe cutting using pipe cutting machinery on concrete slab.
7. Prohibit temporary placement and storage of steel members on concrete slab.
8. Prohibit acids and acidic detergents from contacting concrete surfaces.
9. Cover concrete floors with drop cloths or use breathable drop cloths during painting. If paint is spilled on concrete floor, remove paint immediately.
10. Protect slab surface from standing moisture for 72 hours to prevent re-emulsification of surface treatment prior to cure

B. Immediately remove mortar splatter, spilled liquids, oil, grease, paint, coatings, and other surface contaminants which could adversely affect completed polished concrete floor system.

C. Repair damaged areas of completed polished concrete floor system to satisfaction of Contracting Officer.

END OF SECTION
SECTION 03 35 40
INTERIOR CONCRETE SLAB REPAIRS AND JOINT FILLER REPLACEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Joint filler removal and replacement, with or without metal keyway.
   1. Contractor is to provide unit price per linear foot in Section 01 22 00 for joint filler removal and
      replacement based on the following formula:
      a. Total Area to be Polished X 0.14 = Total Projected Linear Feet of Joint Filler Removal and
         Replacement to be Included and Broken Out in the Bid.

B. Spalled joint repair or joint with metal keyway (less than 3/4”)
   1. Contractor is to provide unit price per linear foot in Section 01 22 00 for keyway segment removal
      and filler installation based on the following formula:
      a. Total Area to be Polished X 0.08 = Total Projected Linear Feet of keyway segment removal
         to be Included and Broken Out in the Bid.

C. Spalled joint repair, joint with metal keyway or self-leveling compound removal (greater than 3/4”)
   1. Contractor is to provide unit price per linear foot in Section 01 22 00 for keyway segment removal
      and repair material installation based on the following formula:
      a. Total Area to be Polished X 0.08 = Total Projected Square Feet of keyway segment and self-
         leveling compound removal and repair material installation to be Included and Broken Out in
         the Bid.

D. Crack repair.
   1. Contractor is to provide unit price per linear foot in Section 01 22 00 for crack cleaning and filling
      based on the following formula:
      a. Total Polished Area X 0.03 = Total Projected Linear Feet of Crack Repair to be Included and
         Broken Out in the Bid.

E. Surface defect repair, including pop-outs, spalls, and gouges.
   1. Contractor is to provide unit price per occurrence in Section 01 22 00 for pop-out and spall
      repair based on the following formula.
      a. Total Polished Area X 0.025 = Total Projected Occurrences of 3/4” to 1-1/2” DIA X 1/2” Deep
         Pop-Outs or Spalls to be Included and Broken Out in the Bid.
      b. Total Polished Area X 0.025 = Total Projected Occurrences of 1-1/2” to 3” DIA X 1/2” Deep
         Pop-Outs or Spalls to be Included and Broken Out in the Bid.

F. Surface embed repair, including cleanouts, in-floor electrical outlets and Walker Duct access holes.
   1. Contractor is to provide unit price per occurrence in Section 01 22 00 for over-coring cleanouts,
      in-floor electrical outlets and Walker Duct access holes based on the following formula.
      a. Total Polished Area X 0.001 = Total Projected Occurrences of 4” average DIA X 1/2” Deep
         Pop-Outs or Spalls to be Included and Broken Out in the Bid.

G. Large area surface repair, existing underlayment removal and replacement
   1. Contractor is to provide unit price per square foot in Section 01 22 00 for large area surface repair
      of rough surface, or removal and replacement of existing underlayment’s > 1/4” in thickness.
      a. 1/4” Minimum Thick Self-leveling Topping to be Included as a Unit Cost

H. Grout coat surface enhancement, including micro-pin holes, pitting and other shallow surface deficiencies.
   1. Contractor is to provide unit price per square foot in Section 01 22 00 for grout coat surface
      enhancement based on the following formula:
      a. Total Polished Area X 0.10 = Total Projected Square Feet of Grout Coat to Include and
         Breakout in Bid.
I. Full Grind, Densify and Polish portions of the project not currently indicated on the drawings.
   1. Contractor is to provide unit price per square foot in Section 01 22 00 to provide a Full Grind, 
      Densify and Polish for portions of the project not currently indicated on the drawings.
      a. Full Grind, Densify and Polish to be included as a Unit Cost.

1.2 RELATED REQUIREMENTS
   A. Section 01 21 00 – Allowances.
   B. Section 01 22 00 – Unit Prices.

1.3 SUBMITTALS
   A. See Section 01 33 00 – Submittals, for submittal procedures.
   B. Joint Filler Installer Qualification Certification:
      1. Company branch or regional office shall provide a list of five projects minimum performed within 
         the last three years of similar type, size and complexity as this contract. Provide project names, 
         addresses, contact names and phone numbers for each project. General Contractor to validate 
         the abilities of the subcontractor prior to submitting bid.
      2. Submit letter of certification, identifying specific individuals that are currently certified installers of 
         the specified materials and are familiar with proper procedures and installation methods as 
         required by the specified product manufacturers.
   C. Product data for:
      1. All products and primary equipment used for repair of existing concrete slab defects.

1.4 QUALITY ASSURANCE
   A. EXCHANGE reserves the right to engage the services of a Concrete Consultant to review, observe and 
      inspect the work in progress.

1.5 ENVIRONMENTAL REQUIREMENTS
   A. Limit and control damage from excessive dust caused by demolition, preparation, and installation of all 
      Work.
   B. Limit and control damage from moisture.
   C. All replaced concrete shall be cured a minimum of 8 calendar days prior to joint filler installation.
   D. Concrete repair area shall be closed to traffic during preparation and repair for a time as recommended 
      by manufacturer.

PART 2 - PRODUCTS and EQUIPMENT

2.1 MATERIALS
   A. Polyurea Joint Filler: Rapid setting, two-component polyurea polymer liquid of 100% solids content, Shore 
      hardness 60 - 65, compatible with construction materials in contact.
      1. SL/60 Polyurea in complementary darker color to match Polished Concrete, by VersaFlex 
         Incorporated
      2. RS65 Polyurea in complementary darker color to match Polished Concrete, by Metzger/McGuire.
      3. HT-PE65 Polyurea in complementary darker color to match Polished Concrete, by Hi-Tech 
         Systems
      4. Colors to be reviewed and approved by AAFES Project Manager in mock-up.
   B. Joint Filler Stain Preventing Film:
      1. SPF by Metzger/McGuire.
   C. Low Viscosity Crack and Spall Repair:
      1. Quick-Mender in complementary matching color, by VersaFlex Incorporated 
      2. Rapid ReFloor in complementary matching color, by Metzger/McGuire.
      3. HT Spall-FX2 in complementary matching color, by Hi-Tech Systems
      4. 10 Minute Mender or Matchcrete by Roadware 
      5. Colors to be reviewed and approved by EXCHANGE Project Manager in mock-up.
   D. Wide Area Surface Repairs:
      1. TRU Self Leveling, by CTS Cement Manufacturing Corporation 
      2. Diama-Top by Ardex Engineered Cements
3. Color after application of Specified Dye to be reviewed and approved by EXCHANGE Project Manager in mock-up.

E. Pin Hole and Surface Pitting Grout Coat:
   1. GM 3000, by Husqvarna Construction Products
   2. StarSeal Fusion, by Vexcon Chemicals, Inc
   3. Diama-Fill, by Ardex Engineered Cements
   4. Color after application to be reviewed and approved by EXCHANGE Project Manager in mock-up.

2.2 EQUIPMENT
   A. Dust extraction system for grinding/sawing:
      1. HEPA filtration vacuum, designed for use with all hand tools when grinding or sawing concrete
         (minimum 125CFM air flow).
      2. Provide one of the following:
         a. 26D, by HTC.
         b. S2400, by Pullman-Ermator.
         d. Approved equal.
   B. Joint Filler Removal and Preparation:
      1. The Mongoose, by Engrave-a-Crete
      2. Humpback Cutter Complete, by Joe Due.
      3. Dust Buggy, by U.S. Saws.
      4. Approved equal.
   C. Crack Repair:
      1. 5" Dustmizer 007, by Joe Due.
      2. 5" Crack Attacker, by Joe Due.
      3. 7" Handheld Crack Chaser, by Joe Due.
      5. SawTec 7" Crac-Vac, by U.S.Saws.
      6. Approved equal.
   D. Surface Grinder: Handheld 4"-7" electric surface grinder with dustless shroud/housing.
      1. Dust Avenger 5, by Joe Due.
      2. Dust Avenger 7, by Joe Due.
      4. SawTec 7" Grinder Vac, by U.S. Saws.
      5. Approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. An evaluation of the existing floor slab shall be conducted, identifying all defects. Scope of repairs shall
      be confirmed by the EXCHANGE Project Manager, Architect of Record, or EXCHANGE Concrete
      Consultant prior to commencement of work. Identify scope of work on Floor Polishing Plan specified in
      other section(s) of Division 3 – Concrete.
   B. Repairs are not to be conducted until Unit Price in attached Worksheet has been reviewed and approved
      by the AAFES Contracting Officer.
   C. Repairs exceeding the Estimated Scope of Repairs developed in the attached Worksheet and included in
      the Base Bid must be approved by the AAFES Contracting Officer prior to executing the work in any new
      Phase.

3.2 PREPARATION
   A. Protect surface of slab immediately adjacent to defect under repair.
3.3 JOINT MILLING AND CAP FILLER REPLACEMENT

A. If existing joint filler is sound and resting on top of saw cut shelf, mill top 1/2" of material and refill with specified Polyurea joint filler.

1. Re-saw the joint to a minimum depth of 1/2" with a dry-cut, vacuum-equipped saw using a slightly oversized blade. The blade width should be sufficient to encapsulate the widest spall along a given contraction joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through the joint.

2. Refill with polyurea joint filler material from the bottom up, taking care not to entrap large air bubbles per manufacturer’s recommendation. Slightly overfill and shave flush to the surface after the grinding process has been completed.

3. Ensure that after grinding, the joint is cut smooth and flush with the finish floor surface, without concave or intermittent, darkened profile.

3.4 FULL DEPTH JOINT FILLER REPLACEMENT

A. If existing joint filler is loose, easily removed, or able to be forced downward with a hand tool, remove all filler material from joint and refill.

1. Re-saw joint full depth with a dry-cut, vacuum-equipped saw using a slightly oversized blade. The blade width should be sufficient to encapsulate the widest spall along a given contraction joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through the joint. Remove all filler material, debris, and laitance.

2. Refill with polyurea joint filler material from the bottom up, taking care not to entrap large air bubbles per manufacturer’s recommendation. Slightly overfill and shave flush to the surface prior to grinding process.

3. Ensure that after grinding, the joint is cut smooth and flush with the finish floor surface, without concave or intermittent, darkened profile.

Note: if shelf width at base of saw cut is less than 1/4" on either side of joint, minimum required filler depth is 2" placed over compressible backer rod or bagged silica sand.

A. If existing joint filler is loose, easily removed, or able to be forced downward with a hand tool, remove all filler material from joint and refill.

1. Re-saw joint full depth with a dry-cut, vacuum-equipped saw using a slightly oversized blade. The blade width should be sufficient to encapsulate the widest spall along a given contraction joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through the joint. Remove all filler material, debris, and laitance.

2. Refill with polyurea joint filler material from the bottom up, taking care not to entrap large air bubbles per manufacturer’s recommendation. Slightly overfill and shave flush to the surface prior to grinding process.

3. Ensure that after grinding, the joint is cut smooth and flush with the finish floor surface, without concave or intermittent, darkened profile.
3.5 NARROW SPALLED JOINT REPAIR OR JOINT WITH METAL KEYWAY (LESS THAN 3/4")

A. For joints that are spalled, are constructed with metal keys or have radius tooled edges not exceeding 3/4" in width at slab surface.
   1. Re-saw the joint edge to a minimum depth of 3/4" with a dry-cut, vacuum-equipped saw allowing removal of the widest spall (or top of radius) along a given joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through joint.
   2. Clean joint of loose concrete, metal key fragments, joint filler, laitance, dirt, debris, backer rod, etc.
   3. Joints must be free of all visible moisture.
   4. Ensure filler penetrates the irregular aggregate interlock portion of the sawn contraction joint as shown below, re-establishing the aggregate interlock that may have been lost due to shrinkage, curling, and lack of reinforcement.
   5. Fill joint cavity with specified Polyurea joint filler per manufacturer’s instructions, taking care not to entrap large air bubbles. Overfill joint slightly and shave flush to slab surface after the grinding process has been completed.

3.6 WIDE SPALLED JOINT REPAIR (GREATER THAN 3/4")

A. For joints that are spalled, contain metal key or self leveling floor material that exceeds 3/4" in width at slab surface.
   1. Re-saw the joint edge to a minimum depth of 1/4" with a dry-cut, vacuum-equipped shaver/leveler allowing removal of the widest spall or non-linear keyway along a given joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through joint. Maintain consistent width of repair to within 1/2 inch in 10 feet.
   2. Overfill repair cavity with overlay material per manufacturer’s instructions and grind flush to slab surface.
3. After repair has cured, and prior to any traffic on patched surface, re-saw original slab joint(s) ¾” in depth to honor joint and fill full depth with Polyurea joint filler per manufacturer’s instructions.

### 3.7 CRACK REPAIR

A. Crack width less than 1/32” without surface spalling:
   1. Do not repair.
   2. Grout coat may be used to fill thin hairline deficiencies.

B. Cracks from 1/32” to 1/4” in width:
   1. Clean crack cavity.
   2. Remove loose concrete, dirt and debris from crack with a wire brush or hand grinder with twisted wire wheel attachment, 1/2” minimum depth, insuring crack sidewall is clean.
   3. Remove any loose segments, including islands formed by crack, with sharp tool.
   4. Use methods that will not widen existing crack.
   5. Vacuum crack to remove all dirt, debris and other laitance.
   6. Mask slab surface along crack as necessary to minimize overfill.
   7. Choose material color that closely matches the adjacent floor.
   8. Install low viscosity crack and spall repair material in accordance with manufacturer’s instructions.
   9. Repeat until all voids are filled and material crowns slab surface.
      a. Do not flood area around crack.
      b. Watch for bubble formation and out gassing.
      c. Do not allow material to gel before adding additional material.
   10. Shave or grind material flush to surface as stipulated by manufacturer.

### 3.8 SURFACE SPALLING REPAIR

A. For slab surface that is chipped and spalled, where the deficiency is 1/2” in length or width up to 3” in length or width, by 1/2” in depth.
   1. Route edge of spall to provide 1/8” deep square edge or 30° edge (consult manufacturer’s data sheet for specific surface preparation instructions).
2. Use small hand grinder with maximum 5" diameter dry diamond blade and vacuum system attachment.
3. Do not overcut slots into existing slab surface.
4. Clean and prep spalled cavity.
5. Wire brush spalled surface to remove all dirt and laitance.
6. Mask slab at perimeter of spall with tape.
7. Install Low Viscosity Crack and Spall Repair material.
8. Polish over repair area with diamond disks to blend surface.
9. Feather filler material into the adjacent concrete floor surface.
10. With 2000 grit disk and firm pressure, add a few burn marks to mottle surface to blend with adjacent floor surface.

   a. NOTE: For inconsistent, varying spalled joints that comply with the measurements in this section, a form material may be needed to temporarily form and support the vertical face of spalled joint edge. Ensure that the repair material will not adhere to the form and the rigid repair material does not fuse the joint together.

11. For cleanouts, in-floor electric outlets and Walker Duct access plates, over-core around perimeter of existing embed by 1/2" in width and depth, then install Low Viscosity Crack and Spall Repair Material.

3.9 BOLT HOLE, CONDUIT REPAIR
A. For slab surfaces containing surface or sub-surface bolts, bolt-hole voids, conduit or subsurface conduit.
   1. Recess steel bolt or conduit a minimum of 1/2" below finish floor by either punching or cutting.
      a. Check with General Contractor prior to cutting into active electrical or communication conduit.
   2. For spall fractured edges less than 30 degrees, square edge to a minimum 1/8" depth with either a drill bit, chisel or edge grinder.
   3. Clean cavity of all debris and laitance with drill activated, brass wire wheel. Vacuum hole to remove all dirt, debris and other laitance.
   4. Dispense Low Viscosity Crack and Spall Repair at moderate pace using steady pressure. Dispense material into void, refilling as necessary to produce slight crown.
   5. Grind material flush to slab surface per manufacturer’s instructions.

3.10 LARGE SURFACE REPAIR, UNDERLAYMENT REMOVAL AND REPLACEMENT
A. For slab surfaces containing wide-area irregular rough surfaces greater than 3" in width and length such as irregular coarse aggregate surfaces or surfaces with existing tile or carpet underlayment’s > 1/4" in thickness.
   1. Define edge perimeter with diamond masonry wheel or shaver/leveler to produce sharp edge, at least 1/8" deep.
   2. Roughen base surface using shaver/leveler to ICRI CSP 3 – 5 and vacuum clean.
   3. Wire brush to remove any small loose material and vacuum again.
   4. Mix and install overlay material in accordance with manufacturer’s instructions.
   5. Place repair material in floor surface defect, float level or leave slightly proud of existing floor.
   6. Grind, densify and polish to match adjacent concrete.
   7. Re-establish original concrete slab joints by sawing completely through patch and re-filling with Polyurea joint filler prior to exposure to traffic.
3.11 SMALL SURFACE PITTING, PINHOLE REPAIR, GROUT COAT

A. For surfaces consisting of micro-deficiencies, pin holes, hairline cracks and other surface clutter that impedes the achievement of the specified overall gloss values
   1. Clean pitted sections with 90-degree angle grinder equipped with wire wheel to remove all dirt/laitance. Wheel should be run over defect in multiple directions to ensure proper cleaning.
   2. Vacuum prepared pitted sections.
   3. Install and disperse grout coat using GM 3000, StarSeal Fusion, or Diama-Fill in accordance with manufacturer’s directions.
   4. Ensure a thin, uniform layer of repair material covers the pitted areas. Refill any low spots as needed.
   5. Grind or polish flush with metal or resin-bond diamonds, ensuring repair material is flush with slab surface.
   6. Repeat repairs in areas as required if repair material pulls out of defects.
   7. Apply required applications and polish smooth to meet specified overall gloss values.

3.12 PROTECTION

A. Protect surfaces of finished floor.
B. Prohibit traffic until floor repairs have received final approval by Owner.
# WORKSHEET

INTERIOR CONCRETE SLAB ENHANCEMENT, REPAIR AND JOINT FILLER REPLACEMENT
(To Be Turned in with Sub-Contractor’s Bid Behind Form 4450-024, Page 2)

<table>
<thead>
<tr>
<th>ENTER TOTAL AREA TO BE POLISHED: _______________ SQUARE FEET</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>ITEM</th>
<th>AREA FROM ABOVE</th>
<th>MULTIPLIER</th>
<th>TOTAL FROM MULTIPLIER</th>
<th>UNIT RATE INCLUDED IN BID</th>
<th>TOTAL COST INCLUDED IN BID</th>
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</thead>
<tbody>
<tr>
<td>Joint Filler Removal and Replacement</td>
<td>36,000</td>
<td>0.14</td>
<td>5014 LF</td>
<td>$2.75 / LF</td>
<td>$13,788.50</td>
</tr>
</tbody>
</table>

**... SAMPLE CALCULATION ... NOT PART OF BID ...**

1. Joint Filler Removal and Replacement

2. Spalled joint repair or joint with metal keyway (less than 3/4")

3. Spalled joint repair, joint with metal keyway or self-leveling compound removal (great than 3/4")

4. Crack repair

5a. Surface defect repair, including pop-outs, spills, and gouges 3/4 – 1-1/2" DIA

5b. Surface defect repair, including pop-outs, spills, and gouges 1-1/2 – 3" DIA

6. Surface embed repair, including cleanouts, in-floor electrical outlets and Walker Duct access holes.

7. Large surface repair, existing underlayment removal and replacement with 1/4" Polished Overlay.

8. Grout coat surface enhancement, including micro-pin holes, pitting and other shallow surface deficiencies

9. Full Grind, Densify and Polish portions of the project not currently indicated on the drawings.

**... DO NOT INCLUDE SAMPLE CALCULATION COST IN BID ...**

**END OF SECTION**

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**EXCHANGE IMAGE UPGRADE**

**Hurlburt Field, Florida**

**AAFES PROJECT NO. 0944-000004 | PWBA 140704**
SECTION 04 01 00
MAINTENANCE OF MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Chemical cleaning of stained masonry surfaces.
      1. Location: Overflows at existing Exchange:
         a. East Elevation (2 locations).
         b. West Elevation (2 locations).

1.02 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Provide data on cleaning solutions.
   C. Manufacturer's Instructions: For cleaning materials, indicate special procedures, conditions requiring special attention.

1.03 QUALITY ASSURANCE
   A. Restorer: Company specializing in masonry restoration with minimum three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING
   A. Store restoration cleaner materials in manufacturer’s packaging.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Restoration and Cleaning Chemicals:

2.02 CLEANING MATERIALS
   A. Cleaning Agent: Type as recommended by manufacturer for conditions encountered.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that surfaces to be cleaned are ready for work of this section.

3.02 PREPARATION
   A. Protect surrounding elements from damage due to restoration procedures.
   B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.
   C. Separate areas to be protected from restoration areas using means adequate to prevent damage.
   D. Cover existing landscaping with tarpaulins or similar covers.
   E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.
   F. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.
   G. Do not allow cleaning runoff to drain into sanitary or storm sewers.
3.03 CLEANING EXISTING MASONRY
   A. Cleaning Detergent or Chemical Cleaning: Clean masonry surfaces at specified locations with manufacturer's recommended cleaning agent in accordance with the manufacturer's instructions.

3.04 CLEANING
   A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.
   B. Clean surrounding surfaces.

END OF SECTION
SECTION 04 05 11
MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Mortar for masonry.
   B. Grout for masonry.

1.02 RELATED REQUIREMENTS
   A. Section 04 20 01 - Masonry Veneer: Installation of mortar.
   B. Section 04 27 31 - Reinforced Unit Masonry: Installation of mortar and grout.
   C. Section 07 19 00 - Water Repellents: Water repellents applied to exterior concrete masonry surfaces.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.
   C. Samples: Submit two samples of each color of mortar required, illustrating mortar color and color range.
   D. Reports: Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.
   E. Reports: Submit reports on grout indicating conformance of component grout materials to requirements of ASTM C476 and test and evaluation reports to requirements of ASTM C1019.
   F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.05 QUALITY ASSURANCE
   A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.
1.07 FIELD CONDITIONS
   A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or 
      applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS
   A. Use only factory premixed packaged dry materials for mortar, with addition of water only at 
      project site.
      1. Masonry below grade and in contact with earth: Type S.
      2. Exterior, Non-loadbearing Masonry: Type S.
   C. Grout Mix Designs:
      1. Bond Beams, Lintels, and Masonry Cores: 3,000 psi strength at 28 days; 8-10 inches 
         slump; provide premixed type in accordance with ASTM C 94/C 94M, or use factory 
         premixed packaged dry materials for grout, requiring addition of water only at project site.
         a. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
         b. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.02 MATERIALS
   A. Packaged Dry Material for Mortar for Unit Masonry: Premixed masonry cement and mason's 
      sand; complying with ASTM C 387/C 387M and capable of producing mortar of the specified 
      strength in accordance with ASTM C 270 with the addition of water only.
      1. Type: Types as scheduled in this section.
      2. Integral Color: Mineral pigments added as required to produce approved color samples.
         a. Colors: As selected by Contracting Officer.
            1) At Architectural CMU: Match mortar colors on existing building.
      3. Integral Water Repellent: Added to mortar at time of manufacture, and compatible with 
         masonry units.
      4. Products:
         b. The QUIKRETE Companies; QUIKRETE® Mason Mix: www.quikrete.com.
   B. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried 
      aggregates; capable of producing grout of the specified strength in accordance with ASTM C 
      476 with the addition of water only.
      1. Type: Fine or Coarse, as required.
      2. Manufacturers:
         b. The QUIKRETE Companies; Core-Fill Grout: www.quikrete.com.
         c. Spec Mix, Inc; Core Fill Grout: www.specmix.com.
   C. Water: Clean and potable.
   D. Bonding Agent: Latex type.

2.03 MORTAR MIXING
   A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM 
      C270 and in quantities needed for immediate use.
   B. Do not use anti-freeze compounds to lower the freezing point of mortar.
   C. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING
   A. Mix grout in accordance with ASTM C94/C94M.
   B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with 
      ASTM C476 for fine and coarse grout.
C. Do not use anti-freeze compounds to lower the freezing point of grout.

2.05 PRECONSTRUCTION TESTING
   A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 40 00 - Quality Requirements.
   B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
      1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.
   C. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
      1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

PART 3 EXECUTION

3.01 PREPARATION
   A. Apply bonding agent to existing concrete surfaces.
   B. Plug clean-out holes for grouted masonry with block masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION
   A. Install mortar and grout to requirements of section(s) in which masonry is specified.
   B. Work grout into masonry cores and cavities to eliminate voids.
   C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
   D. Do not displace reinforcement while placing grout.
   E. Remove excess mortar from grout spaces.

3.03 GROUTING
   A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.
   B. Low-Lift Grouting:
      1. Limit height of pours to 12 inches.
      2. Limit height of masonry to 16 inches above each pour.
      3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
      4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
   C. High-Lift Grouting:
      1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
      2. Hollow Masonry: Limit lifts to maximum 4 feet and pours to maximum height of 24 feet.
      3. Place grout for spanning elements in single, continuous pour.

3.04 FIELD QUALITY CONTROL
   A. An independent testing agency will perform field tests, in accordance with provisions of Section 01 40 00 - Quality Requirements.
   B. Test and evaluate mortar in accordance with ASTM C780 procedures.
      1. Test with same frequency as specified for masonry units.
   C. Test and evaluate grout in accordance with ASTM C1019 procedures.
      1. Test with same frequency as specified for masonry units.

END OF SECTION
SECTION 04 20 01
MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Reinforcement and Anchorage.
B. Flashings.
C. Installation of Lintels.
D. Accessories.

1.02 RELATED REQUIREMENTS
A. Section 04 05 11 - Masonry Mortaring and Grouting.
B. Section 04 27 31 - Reinforced Unit Masonry: Architectural concrete block.
C. Section 05 40 00 - Cold-Formed Metal Framing: Steel stud backup for masonry veneer; glass-mat-faced gypsum sheathing.
D. Section 05 50 00 - Metal Fabrications: Loose steel lintels.
E. Section 07 19 00 - Water Repellents: Applied to exterior masonry veneer surfaces.
F. Section 07 21 00 - Thermal Insulation: Applied over weather barrier.
G. Section 07 25 00 - Weather Barriers: Applied over sheathing.
H. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS
E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data for masonry units, masonry veneer anchors, flashings and accessories.
C. Samples: Submit four samples each of color of architectural concrete block required to illustrate color, texture, and extremes of color range.
D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.05 QUALITY ASSURANCE
A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

1.06 MOCK-UP
A. Construct a masonry veneer wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories, structural backup, wall openings, flashings, wall insulation, and weather barrier in mock-up.
B. Locate where directed.
C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.08 FIELD CONDITIONS
A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS (CMU)
A. Architectural Concrete Block: As specified in Section 04 27 31.

2.02 MORTAR AND GROUT MATERIALS
A. Mortar and Grout: As specified in Section 04 05 11.

2.03 REINFORCEMENT AND ANCHORAGE
A. Masonry Veneer Anchors: Single screw veneer tie for metal stud construction, with dual-diameter barrel and factory-installed EPDM washers to seal both the face of the insulation and the air/vapor barrier.
   1. Manufacturer: Hohmann & Barnard, Inc; Product “Thermal 2-Seal Wing Nut Anchor”: www.h-b.com; of approved equivalent.
   3. Anchor Barrel Finish: Type 304 stainless steel.
      a. Finish: Hot-dip galvanized after fabrication, per ASTM A153/A153M
   5. Anchor Lengths and Pintle Lengths: As required for job conditions.

2.04 FLASHINGS
A. Flexible Flashing: Polyethylene film coating laminated to a 5 oz/sq ft copper sheet, self-adhering.
   1. Locations for Use: Cavity wall through-wall and surface-mount flashing.
   2. Manufacturer:
      a. Hohmann & Barnard, Inc; Copper-Fabric SA Self-Adhering Flashing: www.h-b.com; or approved equivalent.
B. Drip Plates: Type 304 stainless steel, 26 gage, with hemmed edge, 3-inches wide.
   1. Manufacturer: Hohmann & Barnard, Inc; Product “Drip Edge”: www.h-b.com; or approved equivalent.
   2. Corner Pieces: Provide matching inside and outside corner pieces
C. Corner and End Dams: Type 304 stainless steel, 26 gage.
   1. Manufacturer: Hohmann & Barnard, Inc; Product “Stainless Steel Corners and End Dams”: www.h-b.com; or approved equivalent.
   2. Provide prefabricated, soldered inside corners, outside corners, and end dams.
   3. Splice Tape: As recommended by metal flashing manufacturer.
D. Stretchable Flashing: Elastic, stretchable, self-adhering, non-woven polyolefin factory laminated to an adhesive, with removable release liner.
   1. Locations for Use: Wall penetrations and other difficult shapes.
   2. Manufacturer: Hohmann & Barnard, Inc; Product “Stretch-X-Seal”: www.h-b.com; or approved equivalent.
E. Primer for Self-Adhering Flashings: As recommended by flashing manufacturer.
F. Sealant: Dow Corning 790 Silicone Building Sealant or approved equivalent.
2.05 ACCESSORIES

A. Joint Filler: Closed cell polyvinyl chlorideneoprene; oversized 50 percent to joint width; self expanding; 3 inch wide by maximum lengths available.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc (including Dur-O-Wal brand); Product #NS Closed Cell Neoprene Sponge: www.h-b.com; or approved equivalent.

B. Weeps: Polypropylene.
   1. Manufacturers:

C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Mortar Diverter: Panels installed at flashing locations.
      a. Manufacturers:

D. Termination Bars: Type 304 stainless steel, 26 gage, 1-1/2-inch high x 8' long, with 3/8-inch flange on top for easy caulking, and 1/4-inch holes spaced 8-inches on center.
   1. Manufacturer:  Hohmann & Barnard, Inc:  Product "T2-Termination Bar":  www.h-b.com; or approved equivalent.

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.
B. Verify that related items provided under other sections are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.
D. Verify that weather barrier installation has been completed.
E. Coordinate flashing work with installation of continuous thermal insulation over weather barrier.

3.02 COURSING

A. Establish lines, levels, and coursing indicated.  Protect from displacement.
B. Maintain masonry courses to uniform dimension.  Form vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
   1. Bond: Running, except where otherwise indicated.
   2. Coursing: One unit and one mortar joint to equal 8 inches.

3.03 PLACING AND BONDING

A. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
B. Remove excess mortar as work progresses.
C. Interlock intersections and external corners, except for units laid in stack bond.
D. Do not shift or tap masonry units after mortar has achieved initial set.  Where adjustment must be made, remove mortar and replace.
E. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges.  Prevent broken masonry unit corners or edges.
F. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with compressible joint filler.
3.04 CAVITY MORTAR CONTROL
   A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
   B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.
   C. Do not allow excess mortar to adhere to veneer anchors.
   D. Do not allow mortar to bridge the air space to the rigid insulation, even at mortar diverters.
   E. Do not allow mortar to bond to flashing materials.

3.05 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER
   A. Install masonry veneer anchor systems in compliance with manufacturer's recommendations.
   B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
   C. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.

3.06 MASONRY FLASHINGS
   A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
      1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 8 inches, minimum, to form watertight pan at non-masonry construction.
      2. Remove or cover protrusions or sharp edges that could puncture flashings.
      3. Seal lapped ends and penetrations of flashing before covering with mortar.
   B. Extend flexible flashings to within 1/4 inch of exterior face of masonry.
   C. Extend flashings at least 10 inches up the exterior face of the back-up wall sheathing.
      1. Anchor top edge of metal and flexible flashings to sheathing with termination bar.
      2. Seal top edge of termination bar to sheathing with silicone sealant.
   D. Install drip plates, prefabricated corners and end dams in accordance with manufacturer's recommendations.

3.07 LINTELS
   A. Install loose steel lintels over openings.
   B. Maintain minimum 8 inch bearing on each side of opening.

3.08 WEEPS
   A. Install weeps in walls at 32 inches maximum on center horizontally above through-wall flashing, above shelf angles and lintels, and at other locations indicated.
      1. Provide closer spacing where indicated or required to achieve effective drainage.

3.09 CONTROL AND EXPANSION JOINTS
   A. Do not continue horizontal joint reinforcement through control or expansion joints.
   B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
   C. Size control joints as indicated on drawings; if not shown, 3/8 inch wide and deep.
   D. Form expansion joint as detailed on drawings.

3.10 TOLERANCES
   A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
   B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

3.11 CUTTING AND FITTING
A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 CLEANING
A. Remove excess mortar and mortar smears as work progresses.
B. Replace defective mortar. Match adjacent work.
C. Clean soiled surfaces with cleaning solution.
D. Use non-metallic tools in cleaning operations.

3.13 PROTECTION
A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION
SECTION 04 27 31
REINFORCED UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Architectural Concrete Block.
B. Reinforcement and Anchorage.
C. Flashings.
D. Accessories.

1.02 RELATED REQUIREMENTS
A. Section 03 30 00 - Cast-in-Place Concrete: Reinforcing steel in concrete footings for reinforced unit masonry.
B. Section 04 05 11 - Masonry Mortaring and Grouting.
C. Section 04 20 01 - Masonry Veneer: Architectural concrete block veneer masonry.
D. Section 07 19 00 - Water Repellents: Water repellents applied to exterior concrete masonry surfaces.
E. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS
F. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
H. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data for masonry units, fabricated wire reinforcement, flashings, and accessories.
C. Shop Drawings: Indicate bar sizes, spacings, reinforcement quantities, bending and cutting schedules, reinforcement supporting and spacing devices, and accessories.
D. Samples: Submit four samples of architectural concrete block units in each color and texture required to illustrate color, texture, and extremes of color range.
E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.05 QUALITY ASSURANCE
A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.
1.06 MOCK-UP
   A. Construct a masonry wall as a mock-up panel sized 6 feet long by 4 feet high; include mortar
      and accessories, reinforcement, grout, and flashing in mock-up.
   B. Locate where directed.
   C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and
      contamination by other materials.

1.08 FIELD CONDITIONS
   A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or
      applicable building code, whichever is more stringent.

PART 2 PRODUCTS
2.01 CONCRETE MASONRY UNITS (CMU)
   A. Architectural Concrete Block: Integrally-colored concrete block manufactured with integral
      water repellent admixture.
      1. Locations for Use: All exterior concrete masonry walls exposed to view, and other
         locations as indicated.
      2. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as
         indicated on the drawings for specific locations.
      3. Special Shapes: Provide non-standard blocks configured for copings, corners, lintels,
         headers, control joint edges, and other detailed conditions.
      4. Load-Bearing Units: ASTM C90, light weight.
      5. Manufacturers:
      6. Product: "Jefferson Series" Color Customized Masonry Units (CCMU) manufactured by
         Block USA, or Trenwyth equivalent.
         a. Exposed Faces: Split-face or smooth-face, as indicated on drawings.
         b. Integral Water Repellent Admixture: "Dry-Block" Block Admixture manufactured by
            W.R. Grace & Co.-Conn: www.graceconstruction.com; or approved equivalent.
         c. Colors: As selected by Contracting Officer from manufacturer's full range of standard
            colors.
         d. Colors: Match colors on existing building, as approved by the Contracting Officer.
            1) Two colors will be required.

2.02 MORTAR AND GROUT MATERIALS
   A. Mortar and Grout: As specified in Section 04 05 11.

2.03 REINFORCEMENT AND ANCHORAGE
   A. Manufacturers:
   B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) yield strength.
      1. Deformed billet-steel bars.
      2. Unfinished.
   C. Single Wythe Joint Reinforcement: Truss or ladder type; ASTM A1064/A1064M steel wire, hot
      dip galvanized after fabrication to ASTM A153/A153M, Class B; 0.1875 inch side rods with
      0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2
      inch of mortar coverage on each exposure.
D. Multiple Wythe Joint Reinforcement: Truss type; ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B; 0.1875 inch cross rods with 0.1483 inch side rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

E. Strap Anchors: Bent steel shapes configured as required for specific situations, 2 in width, 3/16 in thick, lengths as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage from masonry face, corrugated for embedment in masonry joint, hot dip galvanized to ASTM A 153/A 153M, Class B.

2.04 FLASHINGS
A. Copper/Polyethylene Flashing: Polyethylene film laminated to a 5 oz/sq ft copper sheet.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc; Copper-Fabric NA Copper Fabric Flashing: www.h-b.com; or approved equivalent.

B. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane, or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

2.05 ACCESSORIES
A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:

B. Joint Filler: Closed cell neoprene; oversized 50 percent to joint width; self expanding; 3 inch wide x by maximum lengths available.
   1. Product: Hohmann & Barnard #NS Closed Cell Neoprene Sponge; or approved equivalent.

C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

D. Water Repellent: As specified in Section 07 19 00.

2.06 MORTAR MIXES
A. Mortar: As specified in Section 04 05 11.

2.07 GROUT MIXES
A. Grout: As specified in Section 04 05 11.

2.08 PRECONSTRUCTION TESTING
A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 40 00 - Quality Requirements.

B. Concrete Masonry: Test each type, class, and grade of concrete masonry unit in accordance with ASTM C140/C140M for conformance to requirements of this specification.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION
A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Clean reinforcement of loose rust.
C. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING
A. Establish lines, levels, and coursing indicated. Protect from displacement.
B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.

3.04 PLACING AND BONDING
A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
B. Lay hollow masonry units with face shell bedding on head and bed joints.
C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
D. Remove excess mortar as work progresses.
E. Interlock intersections and external corners, except for units laid in stack bond.
F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.05 REINFORCEMENT AND ANCHORAGE
A. Reinforcement Bars: Secure at locations indicated and to avoid displacement during grouting. Minimum spacing between bars or to masonry surfaces shall be one bar diameter.
   1. Welding of splices is not permitted.
B. Joint Reinforcement: Install horizontal joint reinforcement 16 inches on center.
   1. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
   2. Place continuous joint reinforcement in first and second joint below top of walls.
   3. Lap joint reinforcement ends minimum 6 inches.
   4. Reinforce joint corners and intersections with prefabricated corners and tees 16 inches on center.
C. Anchors: Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.
D. Anchors: Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.
E. Reinforced Hollow Unit Masonry: Keep vertical cores to be grouted clear of mortar, including bed area of first course.
   1. Bond Beams: At bond beams or other locations for horizontally reinforced masonry, provide special masonry units or saw to accommodate reinforcement.

3.06 MASONRY FLASHINGS
A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 8 inches, minimum, to form watertight pan at non-masonry construction.
      a. Always form dams over windows, doors, and other openings.
2. Remove or cover protrusions or sharp edges that could puncture flashings.
3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Extend laminated flashings to within 1/4 inch of exterior face of masonry.
C. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.07 GROUTING
A. Grouting: As specified in Section 04 05 11.

3.08 CONTROL AND EXPANSION JOINTS
A. Do not continue horizontal joint reinforcement through control or expansion joints.
B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
C. Size control joints as indicated on drawings; if not shown, 3/8 inch wide and deep.
D. Form expansion joint as detailed on drawings.

3.09 BUILT-IN WORK
A. As work progresses, install built-in metal door frames, glazed frames, fabricated metal frames, anchor bolts, and plates and other items to be built into the work and furnished under other sections.
B. Install built-in items plumb, level, and true to line.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 8 inches from framed openings.
D. Do not build into masonry construction organic materials that are subject to deterioration.

3.10 TOLERANCES
A. Maximum Variation from Alignment of Columns and Pilasters: 1/4 inch.
B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.11 CUTTING AND FITTING
A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for conformance to requirements of this specification.

3.13 CLEANING
A. Remove excess mortar and mortar smears as work progresses.
B. Replace defective mortar. Match adjacent work.
C. Clean soiled surfaces with cleaning solution.
D. Use non-metallic tools in cleaning operations.

3.14 SEALING
A. Seal exterior concrete masonry surfaces as specified in Section 07 19 00.

3.15 PROTECTION
A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION
SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members, support members and struts.
B. Base plates.
C. Grouting under base plates.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Anchor bolt installation in concrete.
B. Section 05 21 00 - Steel Joist Framing.
C. Section 05 31 00 - Steel Decking: Support framing for small openings in deck; shear stud connectors.
D. Section 05 40 00 - Cold-Formed Metal Framing.
E. Section 05 50 00 - Metal Fabrications: Steel fabrications affecting structural steel work.
F. Section 13 34 19 - Metal Building Systems (Canopy).

1.03 REFERENCE STANDARDS

F. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.
G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
L. ASTM A1085/A1085M - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS); 2015.
T. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
V. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
W. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Shop Drawings: Submit shop drawings prepared under supervision of a Structural Engineer registered in the State in which the Project is located, including details and schedules for fabrication and assembly of structural steel members, procedures, and diagrams.
1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS A2.4 welding symbols and show size, length, and type of each weld.
2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.
3. Contract documents shall not be used for shop drawings, including erection plans or details.
4. All shop drawings which are resubmitted for any reason shall have all revised items clouded or identified for each submittal.
5. All structural steel connections not specifically detailed on the drawings shall be designed to resist forces indicated, by the Contractor, under the direct supervision of a professional engineer registered in the State in which the Project is located.
6. Design calculations for the connections designed by the Contractor shall be submitted for the files of the Architect and Engineer. Calculations shall bear the seal of a professional engineer registered in the State in which the Project is located. Shop drawings containing connections for which calculations have not been received will be returned uncheck as an incomplete submittal.
7. Shop drawings shall be sealed by the professional engineer that provided the connection design to confirm that the connections shown on the shop drawings are in accordance with the submitted design calculations.
8. For each connection, the following shall be noted on the shop drawings:
   a. Required design reaction.
   b. Calculation sheet number for design.
   c. Capacity of detailed connection.
9. Where reactions are not provided, provide for 1/2 maximum capacity of beam per AISC.
C. Product Data:
1. Structural steel (each type), including certified copies of mill test reports covering chemical and physical properties.
2. High-strength bolts (each type), including nuts and washers.
3. Structural steel primer paint.
4. Shrinkage-resistant grout.
D. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
E. Fabricator Test Reports: Comply with ASTM A1011/A1011M.
F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

G. Fabricator’s Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC (MAN) “Steel Construction Manual.”

B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

C. Erector: Company specializing in performing the work of this section with minimum three years of documented experience.

D. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

1.06 DELIVERY, STORAGE & HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration. If bolts and nuts become dry or rusty, clean and relubricate before use.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Wide Flange Beams and Columns: ASTM A992/A992M, Grade 50.

B. Steel Tubing: ASTM A1085, cold-formed welded hollow structural sections (HSS) tubing.

C. Steel Base Plates, Stiffener Plates, Column Cap Plates, Beam Connections, Miscellaneous Steel Channels and Angles: ASTM A36/A36M.

D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

E. Connection Material: Unless otherwise noted on the drawings, stiffener plates, doubler plates, gusset plates and the connecting plates shall be the same grade of steel as members being connected.
   1. Finish: Black, except where indicated to be galvanized.

F. Sag Rods: ASTM A 36/A 36M.

G. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or ASTM A325M, Type 1, medium carbon, galvanized, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436 washers.


I. Load Indicator Washers: Provide washers complying with ASTM F959 at connections requiring high-strength bolts.

J. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

K. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
   2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
   3. Height Change, Plastic State: when tested according to ASTM C827/C827M:
      b. Minimum: Plus 1 percent.

L. Shop and Touch-Up Primer: "10-99 Primer" manufactured by Tnemec Company, Inc., or approved equivalent.
M. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type II - Organic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION
A. Shop fabricate to greatest extent possible.
B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
C. Fabricate connections for bolt, nut, and washer connectors.
D. Simple Beam Connections: Standard double angle framed beam connections using bolts as specified.
   1. Seated beam connections and stiffened seated beam connections shall not be used unless indicated on the drawings or unless Engineer approval is obtained to verify capacity of supporting member for the resulting eccentricity. The fabricator must verify and bear responsibility that the use of such connections does not interfere with Architectural or MEP requirements.
E. Develop required camber for members.
F. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.03 FINISH
A. Surface Preparation and Painting: Prepare surface according to SSPC-PS Guide 7.00 and apply one coat of specified primer to provide a dry film thickness of not less than 2.5 mils.
B. Shop prime structural steel members, except those indicated to be galvanized. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
   1. Apply 2 coats of paint to surfaces that are inaccessible after assembly or erection.
      Change color of second coat to distinguish it from first.
C. Galvanize structural steel members, where indicated, to comply with ASTM A 123/A 123M. Provide minimum 2.0 oz/sq ft galvanized coating.

2.04 SOURCE QUALITY CONTROL
A. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts", testing at least 50 percent of bolts at each connection.
B. Welded Connections: Visually inspect all shop-welded connections and test at least 20 percent of welds using one of the following:
   1. Ultrasonic testing performed in accordance with ASTM E164.
   2. Magnetic particle inspection performed in accordance with ASTM E709.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION
A. Erect structural steel in compliance with AISC S303 "Code of Standard Practice for Steel Buildings and Bridges".
B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
C. Field weld components indicated on shop drawings.
D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".
E. Do not field cut or alter structural members without approval of Contracting Officer's Representative.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

### 3.03 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts", testing at least 50 percent of bolts at each connection.

C. Welded Connections: Visually inspect all field-welded connections and test at least 20 percent of welds using one of the following:
   1. Ultrasonic testing performed in accordance with ASTM E164.
   2. Magnetic particle inspection performed in accordance with ASTM E709.

D. Correct deficiencies in structural steel work that inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

END OF SECTION
SECTION 05 21 00
STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.
B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
C. Supplementary framing for roof openings greater than 18 inches.

1.02 RELATED REQUIREMENTS

A. Section 05 12 00 - Structural Steel Framing: Superstructure framing.
B. Section 05 31 00 - Steel Decking: Support framing for openings less than 18 inches in decking; shear stud connectors.
C. Section 05 50 00 - Metal Fabrications: Non-framing steel fabrications attached to joists.

1.03 REFERENCE STANDARDS

C. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.
K. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
L. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.
M. SJI (SPEC) - Catalog of Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders; 2011.
N. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; 2008.
O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
P. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Submit product data and installation instructions for each type of joist and accessory.
C. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.
D. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.
E. Manufacturer's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE
A. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
   1. Professional Structural Engineer shall also design joists with cantilevers or concentrated loads or joist sizes for which standard load tables are not applicable.
B. Perform Work, including that for headers and other supplementary framing, in accordance with SJI (SPEC) Standard Specifications Load Tables and SJI Technical Digest No. 9.
C. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
D. Erector Qualifications: Company specializing in performing the work of this section with minimum 3 years documented experience.
E. Inspection: Inspect joists in accordance with SJI Standard Specifications.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Steel Joists:
   1. Canam Group Inc: www.canam-steeljoists.ws

2.02 MATERIALS
A. Open Web Joists: Types as indicated on drawings:
   1. Provide bottom and top chord extensions as indicated or as required for finished product.
   2. Minimum End Bearing on Steel Supports: 2-1/2 inches.
   3. Minimum End Bearing on Concrete or Masonry Supports: 4 inches.
   4. Finish: Shop primed.
B. High-Strength Structural Bolts, Nuts, and Washers: ASTM A325 or ASTM A325M, Type 1, medium carbon, galvanized, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436 washers.
C. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36/A 36M.
D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION
A. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists; however, deduct area of holes from the area of chord when calculating strength of member.
B. Extended Ends: Provide extended ends on joists where indicated, complying with SJI Specifications and load tables.
C. Top Chord Extension: Provide top chord extensions ("S" type) on joists where indicated, complying with SJI Specifications and load tables.
D. Bridging: Provide horizontal or diagonal type bridging for joists and joist girders, complying with SJI Specifications.
   1. Provide bridging anchors for ends of bridging lines terminating at walls or beams.
2.04 FINISH
A. Shop prime joists as specified, to provide a continuous, dry paint film not less than 2.5 mil thick.
B. Prepare surfaces to be finished in accordance with SSPC-SP 3.

2.05 SOURCE QUALITY CONTROL
A. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts", testing at least 20 percent of bolts at each connection.
B. Welded Connections: Visually inspect all shop-welded connections.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions prior to beginning work.

3.02 ERECTION
A. Place and secure joists in accordance with SJI Specifications, final shop drawings, and as herein specified.
B. Erect joists with correct bearing on supports.
C. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
D. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
E. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
F. Position and field weld joist chord extensions and wall attachments as detailed.
G. Install supplementary framing for roof openings greater than 18 inches.
H. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
   1. Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.
   2. Where open web joist lengths are 40 feet and longer, install a center row of bolted bridging to provide lateral stability before slackening of hoisting lines.
I. Do not field cut or alter structural members without approval of joist manufacturer.
J. After erection, prime welds, damaged shop primer, and surfaces not shop primed.

3.03 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.
B. Welded Connections: Visually inspect all field-welded connections and test at least 20 percent of welds using one of the following:
   1. Ultrasonic testing performed in accordance with ASTM E164.
   2. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION
SECTION 05 31 00
STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Roof deck.
B. Supplementary framing for openings up to and including 18 inches.
C. Bearing plates and angles.

1.02 RELATED REQUIREMENTS
A. Section 05 12 00 - Structural Steel Framing.
B. Section 05 21 00 - Steel Joist Framing: Support framing for openings larger than 18 inches.
C. Section 05 50 00 - Metal Fabrications: Steel angles at deck edges.

1.03 REFERENCE STANDARDS
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
F. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System; 2006.
G. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
I. SDI (DM) - Publication No.31, Design Manual for Composite Decks, Form Decks, Roof Decks; Steel Deck Institute; 2007.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
D. Certificates: Certify that decks meet or exceed specified requirements.
E. Submit manufacturer's installation instructions.
F. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
G. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE
A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

C. Installer Qualifications: Company specializing in performing the work of this Section with minimum 3 years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Cut plastic wrap to encourage ventilation.
B. Store deck on dry wood sleepers; slope for positive drainage.

PART 2  PRODUCTS
2.01 MANUFACTURERS
A. Steel Deck:

2.02 STEEL DECK
A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
   1. Calculate to structural working stress design and structural properties specified.
B. Roof Deck: Non-composite type, fluted steel sheet:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS), with G90/Z275 galvanized coating.
      a. Grade as required to meet performance criteria.
   2. Span Design: Multiple.
   3. Minimum Base Metal Thickness: 22 gage, 0.0299 inch.
   5. Profile: Fluted; SDI WR.
   7. End Joints: Lapped, mechanically fastened or welded.

2.03 ACCESSORY MATERIALS
A. Bearing Plates and Angles: ASTM A36/A36M steel, unfinished.
B. Welding Materials: AWS D1.1/D1.1M.
C. Mechanical Fasteners:
   1. Design Requirements for Sidelap Connections: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications, ICC-ES AC43, and FM DS 1-28/FM DS 1-29 wind uplift resistance.
   2. Deck to Framing Fasteners: #12 TEKS heavy-duty, self-drilling fasteners with hex washer head, #5 drill point, and "Climaseal" finish, as manufactured by ITW Buildex: www.itwbuildex.com; or approved equivalent.
   3. Sidelap Fasteners: #10 TEKS light-duty, self-drilling fasteners with hex washer head, #3 drill point, and "Climaseal" finish, as manufactured by ITW Buildex: www.itwbuildex.com; or approved equivalent.
   D. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
   E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
   F. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.

2.04 FABRICATED DECK ACCESSORIES
A. Sheet Metal Deck Accessories: Metal closure strips and cover plates, 22 gage, 0.0299 inch thick sheet steel; of profile and size as indicated or as required; galvanized.
2.05 FABRICATION
   A. General: Form deck units in lengths of three or more spans, with flush, telescoped, or nested 2-inch laps at ends and interlocking or nested side laps, unless otherwise noted. End laps shall occur over a support.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION
   A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
   B. On concrete and masonry surfaces provide minimum 4 inch bearing.
   C. On steel supports provide minimum 2-1/2 inch bearing.
   D. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute, except where closer spacing is indicated.
      1. At Contractor's option, unless otherwise indicated, either mechanical fasteners or welds may be used.
      3. Welding: Use fusion welds through weld washers.
   E. At mechanically fastened male/female side laps fasten at 24 inches on center maximum.
   F. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
   G. Weld deck in accordance with AWS D1.3/D1.3M.
   H. At deck openings from 6 inches to 18 inches in size, provide 2 by 2 by 1/4 inch steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and mechanically attach to deck at each flute.
   I. Where deck changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Mechanically attach or fusion weld 12 inches on center maximum.
   J. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
   K. Close openings above walls and partitions perpendicular to deck flutes with double row of foam cell closures.
   L. Immediately after mechanically fastening or welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating with touch-up primer.

3.03 FIELD QUALITY CONTROL
   A. Testing: Owner will engage a qualified independent testing agency to perform field quality-control testing.
   B. Field welds will be subject to inspection.
   C. Testing agency will report test results promptly and in writing to Contractor and Contracting Officer.
   D. Remove and replace work that does not comply with specified requirements.
   E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

END OF SECTION
SECTION 05 40 00
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall and interior wall framing (18 gage and heavier).
B. Exterior wall sheathing.
C. Formed steel joist and purlin framing and bridging.
D. Sill sealer at exterior stud walls.

1.02 RELATED REQUIREMENTS

A. Section 04 20 01 - Masonry Veneer: Veneer masonry supported by wall stud metal framing.
B. Section 05 12 00 - Structural Steel: Structural building framing.
C. Section 06 10 00 - Rough Carpentry: Wood blocking and miscellaneous framing.
D. Section 07 21 00 - Thermal Insulation: Insulation within framing members.
E. Section 07 25 00 - Weather Barriers: Weather barrier over sheathing.
F. Section 09 21 16 - Gypsum Board Assemblies: Lightweight, non-load bearing metal stud framing (20 gage and lighter).
G. Section 09 51 00 - Acoustical Ceilings: Ceiling suspension system.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
D. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.
C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
D. Product Data: Provide manufacturer's data on wall sheathing materials and sill sealer materials.
E. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
   1. Indicate stud and purlin layout.
   2. Describe method for securing studs to tracks and for welded framing connections.
   3. Provide design engineer's stamp on shop drawings.

F. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

D. Metal stud manufacturer shall be responsible for detailing all connections.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing:

B. Framing Connectors and Accessories:
   1. Same manufacturer as metal framing.

2.02 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

B. Design Criteria: Provide completed framing system having the following characteristics:
   1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100-12.
   2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
   3. Design Loads: In accordance with applicable codes.
   4. Live load deflection meeting the following, unless otherwise indicated:
      a. Exterior Walls: Maximum horizontal deflection under wind load of 1/600 of span.
      1) Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
      b. Design non-axial loadbearing framing to accommodate not less than 1/2 in vertical deflection.
   5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

C. Shop fabricate framing system to the greatest extent possible.

D. Deliver to site in largest practical sections.
2.03 FRAMING MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
   1. Gage and Depth: As indicated on the drawings. Provide heavier gage if required to meet specified performance levels. Minimum thicknesses shall be as follows:
      a. 18 Gage: 43 mils, 0.0428 inch.
      b. 16 Gage: 54 mils, 0.0538 inch.
      c. 14 Gage: 68 mils, 0.0677 inch.
      d. 12 Gage: 97 mils, 0.0966 inch.

   1. Base Metal: Structural Steel (SS), Grade 50/340, Class 1.
   2. Gage and Depth: As indicated on the drawings. Provide heavier gage if required to meet specified performance levels. Minimum thicknesses shall be as follows:
      a. 18 Gage: 43 mils, 0.0428 inch.
      b. 16 Gage: 54 mils, 0.0538 inch.
      c. 14 Gage: 68 mils, 0.0677 inch.
      d. 12 Gage: 97 mils, 0.0966 inch.

D. Framing Connectors: Factory-made, formed steel sheet.
   1. Material: ASTM A653/A653M SS Grade 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gage, 0.1345 inch, and factory punched holes and slots.
   2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
      a. Where continuous studs bypass structural supports, connect stud to support in manner allowing vertical movement of support without affecting studs; allow for minimum movement of 1/2 inch.
      b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical movement of structure without affecting studs; allow for minimum movement of 1/2 inch.
      c. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 10 feet.
   5. Wall Stud Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connections where indicated on the drawings.
   6. Products: Equivalent to the following:


g. Simpson Strong Tie, By-Pass Movement Connectors; SCB, size as required: www.strongtie.com.


i. Simpson Strong Tie, Head of Wall Movement Connectors; SCW 5.5 Head-of-Wall Clip: www.strongtie.com.

2.04 WALL SHEATHING
A. Wall Sheathing: Glass mat faced gypsum; ASTM C 1177/C 1177M, square long edges, 5/8 inch Type X fire-resistant.

1. Glass-Mat Faced Products: Provide one of the following:

2.05 ACCESSORIES

   a. Width: As required to match stud floor track width.

2. Accessories: Equivalent to the following products manufactured by Protecto Wrap Company:
   a. Primer: Protecto "#100 Primer."

B. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

D. Weather Barrier: As specified in Section 07 25 00.

E. Sealant: Equivalent to Dow Corning 795 or Pecora 895.

2.06 FASTENERS
A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

1. Products:
   a. ITW Commercial Construction North America; ITW CCNA-Buildex Teks Select Series: www.ITWBuildex.com; or approved equivalent.

B. Anchorage Devices: Powder actuated.

C. Welding: In conformance with AWS D1.1/D1.1M.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that building framing components are ready to receive work.

B. Verify field measurements and adjust installation as required.
3.02 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.

B. Installation of Sill Sealer at Exterior Walls:
   1. Knock off and remove any rough or jagged concrete edges and verify that concrete substrate is clean and dry.
   2. Apply primer to clean concrete surface and allow to dry prior to installing sill sealer. Do not cover wet primer.
   3. Install sill sealer in accordance with manufacturer recommendations.
   4. Tape all butt joints in sill sealer with joint tape.

C. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 16 inches on center. Coordinate installation of sealant with floor and ceiling tracks.

D. Cut framing members by sawing or shearing; do not torch cut.

E. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using fastener method.
   1. Locate and install mechanical fasteners according to Shop Drawings, complying with requirements for spacing, edge distances, and screw penetration.

F. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

G. Install load bearing studs full length in one piece. Splicing of studs is not permitted.

H. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.

I. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

J. Install intermediate studs above and below openings to align with wall stud spacing.

K. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.

L. Attach cross studs to studs for attachment of fixtures anchored to walls.

M. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

N. Install horizontal bridging in stud walls at maximum spacing of 48 inches o.c.

O. Touch-up field welds and damaged galvanized surfaces with primer.

3.03 INSTALLATION OF JOISTS AND PURLINS

A. Install framing components in accordance with manufacturer's instructions.

B. Make provisions for erection stresses. Provide temporary alignment and bracing.

C. Place joists at spacings as indicated, and not more than 2 inches from abutting walls. Connect joists to supports using fastener method indicated.

D. Set ceiling joists parallel and level, with lateral bracing and bridging.

E. Locate joist end bearing directly over load bearing studs or provide load distributing member to top of stud track.

F. Provide web stiffeners at reaction points.

G. Touch-up field welds and damaged galvanized surfaces with primer.

3.04 WALL SHEATHING

A. Wall Sheathing: Install in accordance with manufacturer's instructions. Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.
B. Finishing: Apply a 3/8 inch bead of sealant to all joints and trowel in firmly until flat. Use backer rod for openings larger than 1/8 inch. Apply sealant to each fastener to cover completely when troweled flat.

3.05 TOLERANCES

A. Maximum Variation from True Position: 1/4 inch.
B. Maximum Variation of any Member from Plane: 1/8 inch.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Shop fabricated steel items.
   B. Steel pipe bollards.
   C. Loose steel lintels.
   D. Door frames for overhead doors.
   E. Downspout boots.

1.02 RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
   B. Section 04 20 01 - Masonry Veneer: Placement of metal fabrications in masonry.
   C. Section 06 10 00 - Rough Carpentry: Concealed wood blocking.
   D. Section 07 71 23 - Manufactured Gutters and Downspouts: Downspouts.
   E. Section 08 33 23 - Overhead Coiling Doors.
   F. Section 09 90 00 - Painting: Paint finish for steel items.

1.03 REFERENCE STANDARDS
   G. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.
   H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
   J. ASTM A1085/A1085M - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS); 2015.
   K. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals.
   B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Welders’ Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

1.05 QUALITY ASSURANCE
A. Design prefabricated aluminum ladders under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

PART 2 PRODUCTS
2.01 MATERIALS - STEEL
A. Steel Sections: ASTM A36/A36M.
B. Steel Tubing: ASTM A1085, cold-formed welded hollow structural sections (HSS) tubing.
C. Steel Tubing: ASTM A500/A500M, Grade B cold-formed structural tubing.
D. Plates: ASTM A283/A283M.
E. Pipe: ASTM A53/A53M, Grade B Schedule 80, hot-dip galvanized finish.
F. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, plain.
G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION
A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Continuously seal joined members by continuous welds.
D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS
A. Bollards: Steel pipe, 6-inch diameter, Schedule 40, concrete filled, crowned cap; galvanized finish.
   1. Pipe shall be 8'-0" long minimum.
B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking, joists, and masonry; prime paint finish, except provide galvanized finish when occurring in exterior walls.
C. Lintels: As detailed; galvanized finish.
D. Frames for Overhead Door Openings and Wall Openings: Channel, Angle, and Tube sections as indicated; prime paint finish. Coordinate fabrication with respective section of work.

2.04 DOWNSPOUT BOOTS
A. Downspout Boots: Smooth interior without boxed corners or choke points; include integral lug slots, integral cleanout, and cleanout cover.
   2. Material: Cast iron; ASTM A48/A48M; casting thickness 3/8 inch (9.5 mm), minimum.
   3. Finish: Manufacturer's standard factory applied powder coat finish.
4. Color: To be selected by Contracting Officer's Representative from manufacturer's full range.
5. Accessories: Manufacturer's standard stainless steel fasteners, stainless steel building wall anchors, integral neoprene gaskets, and rubber coupling.
6. Size:
   a. Top Bell: Coordinate with downspout sizes; refer to Section 07 71 23.
   b. Length: 24 inches minimum.
7. Manufacturers: Equivalent to the following:

2.05 FINISHES - STEEL
   A. Prime paint all steel items, except as follows:
      1. Galvanize items specified for galvanized finish.
      2. Galvanize items to be embedded in concrete or masonry.
      3. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
   B. Prepare surfaces to be primed in accordance with SSPC-SP 6 - Commercial Blast Cleaning.
   C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
   D. Prime Painting: One coat.
   E. Galvanizing of Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 2.0 oz/sq ft galvanized coating.
   F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

2.06 FABRICATION TOLERANCES
   A. Squareness: 1/8 inch maximum difference in diagonal measurements.
   B. Maximum Offset Between Faces: 1/16 inch.
   C. Maximum Misalignment of Adjacent Members: 1/16 inch.
   D. Maximum Bow: 1/8 inch in 48 inches.
   E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION
   A. Clean and strip primed steel items to bare metal where site welding is required.
   B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete.
   C. Coordinate installation of concealed wood blocking in walls at attachment points for:
      1. Downspout boots.

3.03 INSTALLATION
   A. Install items plumb and level, accurately fitted, free from distortion or defects.
   B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
   C. Field weld components as indicated on shop drawings.
   D. Perform field welding in accordance with AWS D1.1/D1.1M.
   E. Obtain approval prior to site cutting or making adjustments not scheduled.
F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES
   A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Exterior guardrails.

1.02 RELATED REQUIREMENTS
A. Section 03 30 00 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
C. Samples: Submit two, 8 inch long samples of handrail. Submit two samples of elbow, Tee, and escutcheon.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Handrails and Railings:
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 RAILINGS - GENERAL REQUIREMENTS
A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
D. Allow for expansion and contraction of members and building movement without damage to connections or members.
E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
2.03 ALUMINUM MATERIALS
   A. Aluminum Pipe: Schedule 40; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.
   B. Straight Splice Connectors: Concealed spigot; cast or machined aluminum.
   C. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

2.04 FABRICATION
   A. Accurately form components to suit specific project conditions and for proper connection to building structure.
   B. Fit and shop assemble components in largest practical sizes for delivery to site.
   C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

2.05 ALUMINUM FINISHES
   A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION
   A. Supply items required to be cast into concrete with setting templates, for installation as work of other sections.
   B. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.03 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
   C. Anchor railings securely to structure.
   D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES
   A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION
SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Roof-mounted curbs.
B. Roofing nailers.
C. Preservative treated wood materials.
D. Fire retardant treated wood materials.
E. Miscellaneous framing and sheathing.
F. Plywood wainscot.
G. Communications and electrical room mounting boards.
H. Concealed wood blocking, nailers, and supports.
I. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS
A. Section 05 40 00 - Cold-Formed Metal Framing: Glass-mat-faced gypsum wall sheathing.
B. Section 06 40 23 - Interior Architectural Woodwork: Interior woodwork specially fabricated for this Project.
C. Section 07 54 00 - Thermoplastic Membrane Roofing.
D. Section 09 21 16 - Gypsum Board Assemblies: Non-loadbearing metal stud framing.
E. Section 09 90 00 - Painting: Paint and fire-retardant (intumescent) coatings.

1.03 REFERENCE STANDARDS
D. PS 1 - Structural Plywood; 2009.
E. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.
G. SPIB (GR) - Grading Rules; 2014.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide technical data on wood preservative materials.
C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING
A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
1. Species: Southern Pine, unless otherwise indicated.
2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
B. Sizes: Nominal sizes as indicated on drawings, S4S.
C. Moisture Content: S-dry or MC19.
D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS
A. Wall Sheathing, at Parapet Walls: Any PS 2 type.
   2. Grade: Structural I Sheathing.
   4. Performance Category: 5/8 PERF CAT.
   5. Edge Profile: Square edge.
B. Plywood Wainscot: For wall protection in stock rooms and other areas indicated on the drawings.
   1. APA C-D plywood.
   2. Exposure 1.
   3. 5/8 inch thick.
   4. Paint ready.
   5. Size: 4' x 8'.
   6. Mounted horizontally to achieve 4'-0" height of wainscoting.
C. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   1. In lieu of fire-retardant treatment, backboards may be painted on all sides and edges with an intumescent paint system as specified in Section 09 90 00.
D. Miscellaneous Panels:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade, thickness as indicated.

2.04 ACCESSORIES
A. Fasteners and Anchors:
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length to achieve full penetration of sheathing substrate.
   3. Anchors: Bolt or ballistic fastener for anchorages to steel.
B. Fasteners for Wood and Plywood to Light Gage Metal Framing and Metal Deck (up to 10 gage, 0.1345 inch): Self-drilling flat head wood-to-metal screws.
   1. Manufacturers:
   2. Wood and Plywood Up to 3/4 Inch Thick:
b. ITW: Traxx 10-16 #3 point.
c. Pre-drill wood if wood thickness is greater than 1/2 inch or use heavier fastener specified below.

3. Wood less than or equal to 1-1/8 inch thickness to 18 Gage (0.0478 inch) and 20 Gage (0.0359 inch) Metal:
   a. Hilti: S-WD 10-24 x 1-1/2 PWH #3 wafer head screw.
   b. ITW: Traxx 10-16 #3 point.
   c. Pre-drill wood if wood thickness is greater than 1/2 inch.

4. Wood less than or equal to 1-3/4 inch thickness to 16 Gage (0.598 inch) and Heavier Metal (less than or equal to 0.232 inches):
   a. Hilti: S-WW 12-24 x 2-1/2 PFH #4 Wings.
   b. ITW: Traxx 12-24 #4 Point with Wings.

5. Wood less than or equal to 2-inch thickness to 16 Gage (0.598 inch) and heavier metal (less than or equal to 1/4 inch):
   a. Hilti: S-WW 1/4-20 x 2-3/4 PFH #4 Wings.

C. Fasteners for Structural Wood Members to Solid Grouted Masonry: Adhesive anchors, size and length as indicated on Drawings.
   1. Anchor adhesive: Cartridge type two-component adhesive for embedding anchors.
      a. HIT HY-70 by Hilti Corp.
      b. Epcon System, Ceramic 6 by ITW Ramset/Red Head
Pleasanton, CA (800) 925-5099.
      d. Substitutions: Not permitted.

D. Fasteners for Non-Structural Wood Members to Masonry: Masonry screw anchor with Phillips or Torx flat head, size and length as shown on the drawings.
   1. Hilti: Kwik-Con II fastener.
   2. ITW: Tapcon masonry anchor.

E. Toggle Bolt Fasteners: For anchorage of non-structural items to hollow masonry.

F. Expansion Shield Fasteners: For anchorage of non-structural items to solid masonry and concrete.

G. Powder Actuated Fasteners: For anchorage of non-structural items to steel.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer’s stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Manufacturers:
   2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Treat rough carpentry items as indicated.
c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. Manufacturers:

D. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
   1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
   2. Treat lumber exposed to weather.
   3. Treat lumber in contact with roofing, flashing, or waterproofing.
   4. Treat lumber in contact with masonry or concrete.
   5. Treat lumber less than 18 inches above grade.
   6. Treat lumber in other locations as indicated.

E. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
   1. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
   2. Treat plywood in contact with roofing, flashing, or waterproofing.
   3. Treat plywood in contact with masonry or concrete.
   4. Treat plywood less than 18 inches above grade.
   5. Treat plywood in other locations as indicated.

PART 3 EXECUTION

3.01 PREPARATION
A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL
A. Select material sizes to minimize waste.
B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS
A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
E. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

C. Wood Nailers: Provide wood nailers at all perimeters and other locations where indicated on the drawings, of total height matching the total thickness of insulation being used.
   1. Install with 1/8 inch gap between each length and at each change of direction.
   2. Mechanically fasten to deck to resist force of 250 lbf per linear foot.
   3. Provide screw fasteners recommended by manufacturer for conditions encountered. Minimum fastener requirements for each wood nailer are as follows:
      a. Space screws 18 inches o.c., maximum, with a minimum 1 inch thread embedment.
      b. Use three anchors per length of wood nailer minimum.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using screws.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.
   4. Size and Location: As indicated on drawings.

3.06 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.07 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane: 1/4 inch in 10 feet maximum, and 1/2 inch in 30 feet maximum.

3.08 CLEANING

A. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

B. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION
SECTION 06 40 23
INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Plastic-laminate and solid surfacing countertops.
B. Solid surfacing window stools.
C. Plastic laminate cabinets.
D. Counter support brackets.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications.
B. Section 06 10 00 - Rough Carpentry.

1.03 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
   1. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcing specified in other Sections.
C. Samples for initial selection of the following in the form of manufacturer's color charts consisting of actual units or sections of units showing the full range of colors, textures, and patterns available for each type of material indicated.
   1. Plastic laminates.
D. Samples for verification of the following:
   1. Laminate-clad panel products, 8 by 10 inches, for each type, color, pattern, and surface finish, with separate samples of unfaced panel product used for core.

1.04 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units without delaying the Work.
B. Quality Standard: Except as otherwise indicated, comply with the following standard:

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
B. Do not deliver woodwork until painting and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet-work is completed, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
1. Verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork by accurate field measurements before being enclosed. Record measurements on final shop drawings.

1.07 COORDINATION

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

PART 2 - PRODUCTS

2.01 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:
   2. Formaldehyde Emission Level for Medium-Density Fiberboard: Comply with requirements of NPA 9.
   3. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
      1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high-pressure decorative laminates that may be incorporated in the Work include, but are not limited to, the following:
         a. Formica Corporation.
         b. Laminart.
         c. Nevamar Corp.
         d. Ralph Wilson Plastics Co.
         e. Pionite.
   D. Adhesive for Bonding Plastic Laminate: Contact cement.
   E. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements in ANSI Z124.3, for Type 5 or Type 6, without a precoted finish.
      1. Products: See Finishes Legend.

2.02 PORTAL MATERIALS

A. Flooring: Century Farm Collection engineered Hardwood Flooring with Permion UV-cured finish in the selected wood species, color or special order color.
   2. Dimensions:
      a. Width: 5 in.
      b. Thickness: ½ in. (1.27 cm).
      c. Length: Variable: 9” – 46.5”.
      d. Wear Layer Thickness: 1/12”.
      e. Number of plys: 5.
   3. Finish: Permion commercial UV cured factory applied finish.
   5. Edge Detail/End Detail: Beveled Edge/Beveled Ends.
   6. Milling: Tongue and groove sides, end matched.
   7. Fire Ratings: Class C when tested in accordance with ASTM E84.
B. Adhesive: Hartco 57 moisture-cured adhesive as provided by Armstrong.
C. Aluminum Trim: Fry Reglet trim as indicated on drawings.
D. Select Maintenance Materials: Armstrong Urethane Wood and Laminate cleaner.
E. Hardness Information: Natural wood products have no minimum hardness specifications since hardness is characteristic of the species and cannot be controlled. The most widely accepted test is the Janka Ball test (ASTM D1037-96A) and the results are only used to compare the PSI rating of one species against another. Individual values may vary due to denseness of cell structure, grain of wood, etc.

2.03 INSTALLATION MATERIALS
A. Screws: Select material, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements.
   1. For metal framing supports, provide screws as recommended by metal-framing manufacturer.
B. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
C. 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.

2.04 FABRICATION, GENERAL
A. Interior Woodwork Grade: Provide interior woodwork complying with the referenced quality standard and of the following grade:
   1. Grade: Custom.
B. Fabricate woodwork to dimensions, profiles, and details indicated.
C. 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.
D. 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 PLASTIC LAMINATE COUNTERTOPS
A. Quality Standard: Comply with AWI Section 400 requirements for countertops.
   1. Grade: Custom.
B. Type of Top: High-pressure decorative laminate complying with the following:
   1. Grade: GP-50, 0.050-inch nominal thickness.
   2. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
      a. See colors noted in Finishes Legend.
   3. Edge Treatment: Same as laminate cladding on horizontal surfaces.

2.06 LAMINATE-CLAD CABINETS (PLASTIC-COVERED CASEWORK)
A. Quality Standard: Comply with AWI Section 400 requirements for laminate-clad cabinets.
   1. Grade: Custom.
B. AWI Type of Cabinet Construction: Flush overlay.
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 nominal thickness.
   2. Vertical Surfaces: GP-28, 0.028-inch nominal thickness.
   3. Edges: 3 mm PVC matching laminate color unless otherwise noted.
D. Materials for Semiexposed Surfaces: Provide surface materials indicated below:
1. Surfaces Other than Drawer Bodies: Thermoset decorative overlay. (Melamine)
2. Drawer Sides and Backs: Thermoset decorative overlay. (Melamine)
3. Drawer Bottoms: Thermoset decorative overlay. (Melamine)

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. See Finishes Legend.

2.07 CABINET HARDWARE AND ACCESSORY MATERIALS

A. Cabinet Hardware Schedule: Refer to schedule below for cabinet hardware required for architectural cabinets.

B. Hardware Standard: documents indicate size, profiles and functional requirements of cabinet hardware and are based on products of specific manufacturers. Other listed manufacturer's products with equal performance characteristics, as judged by the Contracting Officer, will be acceptable. Subject to compliance with requirements, provide hardware by one of the following to match products as scheduled:
1. Accuride.
2. Blum.
4. Corbin.
5. D. Mockett & Co., Inc.
6. Hallmack.
7. Ives.
9. Lawrence.
11. Stanley.

C. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA code number indicated.
1. Satin Stainless Steel BHMA 630.

D. For concealed hardware provide manufacturer's standard finish that complies with product class requirements of BHMA A156.9.

E. Cabinet Hardware Schedule: Performance requirements for required cabinet hardware is as defined by reference to specific manufacturer's product numbers and as follows:
1. Cabinet Door Hinges: Concealed type with horizontal adjustment for 130° to 175° opening, self-closing, all steel construction. Julius Blum, Inc. or Hafele.
2. Drawer Slides: Equip each drawer with side-mounted, full extension, ball bearing nylon roller drawer slides with load capacity of 75 lbs. for drawers with face height less than 8 inches, 150 lbs. for drawers with face over 8 inches (Accuride or Knape & Vogt).
3. Cabinet Locks: Provide standard pin type locks at all cabinets, one per room keyed separately and remainder keyed alike within each room unless directed otherwise. Subject to compliance with requirements, provide products as manufactured by National or Corbin.
5. Grommets: 2" outside diameter for countersinking into countertop. Color to match countertop. D. Mockett & Co., Inc.
6. Silencers: Provide resilient silencers at all doors and drawer fronts.
8. Adjustable Shelf Standards and Supports:
   a. For 24" maximum depth shelves: Knape & Vogt: 87 heavy duty wall standard; 186/187 heavy duty wall bracket.

F. Counter Support Brackets: Aluminum, equivalent to the following:
2. Size: 18" x 18".
3. T-Extrusion: 2" x 2" x 0.25".
4. Weight Capacity: 450 lbs per bracket.
5. Finish: Clear anodized.
6. Spacing: Provide brackets at spacing indicated, but do not exceed 32" on center.

2.08 SHOP FINISHING
A. Quality Standard: Comply with AWI Section 1500, unless otherwise indicated.
B. General: Priming and finishing of interior architectural woodwork required to be performed at fabrication shop are specified in this section. Refer to Division 9 Section “Painting” for material and application requirements for woodwork.
C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork as applicable to each unit of work.
   1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative overlay.

PART 3 - EXECUTION
3.01 PREPARATION
A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.02 INSTALLATION
A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.
B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches for plumb and level (including tops).
C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for complete installation.
E. Tops: Anchor securely to base units and other support systems as indicated. Caulk space between backsplash and wall with specified sealant.
   1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
   2. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c.
   1. Install counter support brackets in accordance with manufacturer’s recommendations.

3.03 ADJUSTING AND CLEANING
A. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
B. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.
3.04 PROTECTION

A. Provide final protection and maintain conditions in a manner acceptable to fabricator and Installer that ensures that woodwork is without damage or deterioration at the time of Substantial Completion.

END OF SECTION
SECTION 07 01 50
MAINTENANCE OF MEMBRANE ROOFING

PART 1  GENERAL
1.01  SECTION INCLUDES
   A. Protection of and modifications to existing roofing system, as required, to accommodate performance of new work as indicated.

1.02  RELATED REQUIREMENTS
   A. Section 01 14 50 - Cutting and Patching: Protection of existing work to remain; cutting and patching.
   B. Section 02 41 16 - Selective Demolition.

1.03  ADMINISTRATIVE REQUIREMENTS
   A. Coordinate with affected mechanical and electrical work associated with roof penetrations.

1.04  QUALITY ASSURANCE
   A. The existing Exchange roof is covered under existing roof warranties.
      1. The Contractor shall obtain information about existing warranties from the Owner, and shall conduct his work in a manner that protects existing roof surfaces and maintains existing warranties.
   B. To maintain the existing warranty, the Contractor shall follow the manufacturer's instructions to modify and/or repair the roof as necessary to accomplish any new work required.
      1. Warranties typically require that any repairs, modifications or additions to the roofing system be approved in writing in advance.
   C. All modifications and/or repairs must be done in accordance with the manufacturer's instructions.
   D. Roofing modifications and/or repairs to any roof currently under warranty must be performed by a roofing contractor approved by the roofing manufacturer.
   E. Manufacturer Approval: Provide written approval from the roofing manufacturer, including the following:
      1. Approval of the installing Roofing Contractor.
      2. Approved installation details.
      3. Verification that the existing warranty will remain in effect.

1.05  FIELD CONDITIONS
   A. Do not remove existing rooftop equipment or roofing membrane when weather conditions threaten the integrity of the building contents or intended continued occupancy.
   B. Maintain continuous temporary protection prior to and during performance of any new work and installation of any required roofing system modifications.

PART 2  PRODUCTS
2.01  MATERIALS
   A. All materials used in modifications and/or repairs to existing roofing system shall be as approved by the manufacturer of the existing warranted roof system.

PART 3  EXECUTION
3.01  GENERAL
   A. Modifications to Existing Roof Membrane: The Roofing Contractor shall be responsible for making modifications to the existing roof as necessary to tie into new construction.
      1. Any work shall be approved by the roofing manufacturer in writing in advance.
      2. A weathertight and leak-free roof shall be provided.
      3. Work shall be done in accordance with roof manufacturer’s recommendations.
      4. Modifications shall be included under the existing warranty.
3.02 FIELD QUALITY CONTROL

A. Manufacturer's Field Reports: If manufacturer's technical representative is required to make any site visits before, during, or after performance of roofing modifications, provide copies of any field reports to Architect.

END OF SECTION
SECTION 07 19 00
WATER REPELLENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Water repellents applied to exterior concrete masonry surfaces.

1.02 RELATED REQUIREMENTS
A. Section 04 05 11 - Masonry Mortaring and Grouting.
B. Section 04 27 31 - Reinforced Unit Masonry: Architectural concrete block.

1.03 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide product description, details of tests performed, limitations, and chemical composition.
C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.

1.04 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

1.05 MOCK-UP
A. Prepare a representative surface 36 by 36 inch in size using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
B. Locate where directed.
C. Mock-up may remain as part of the Work.

1.06 FIELD CONDITIONS
A. Protect liquid materials from freezing.
B. Do not apply water repellent when ambient temperature is lower than 40 degrees F or higher than 100 degrees F.

PART 2 PRODUCTS

2.01 MATERIALS
A. Water-Repellent Sealer: Clear, penetrating sealer consisting of water-based blend of silanes and siloxanes to provide maximum water-repellency when post-applied to integrally water-repellent-treated CMU wall construction.
   1. Compatible and recommended for use with water-repellent mortar admixture specified in Section 04 05 11 - Masonry Mortaring and Grouting.
   2. Compatible and recommended for use with water-repellent block admixture specified in Section 04 27 31 - Reinforced Unit Masonry.
   4. Number of Coats: Two.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify joint sealants are installed and cured.
C. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.

3.02 PREPARATION

A. Protection of Adjacent Work:
   1. Protect adjacent landscaping, property, and vehicles from drips and overspray.
   2. Protect adjacent surfaces not intended to receive water repellent.
B. Prepare surfaces to be coated as recommended by water repellent manufacturer for best results.
C. Do not start work until masonry mortar substrate is cured a minimum of 7 days.
D. Remove loose particles and foreign matter.
E. Remove oil and foreign substances with a chemical solvent that will not affect water repellent.
F. Scrub and rinse surfaces with water and let dry.
G. Allow surfaces to dry completely to degree recommended by water repellent manufacturer before starting coating work.

3.03 APPLICATION

A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended as producing the best results.
B. Apply at rate recommended by manufacturer, continuously over entire surface.
C. Apply two coats, minimum.
D. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

END OF SECTION
SECTION 07 21 00
THERMAL INSULATION

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Rigid board continuous insulation in exterior cavity wall construction.
B. Batt insulation in exterior wall and ceiling construction.
C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02  RELATED REQUIREMENTS

A. Section 04 20 01 - Masonry Veneer: Masonry veneer anchors for securing exterior rigid continuous insulation to sheathing.
B. Section 05 40 00 - Cold-Formed Metal Framing: Supporting construction for batt insulation.
C. Section 07 25 00 - Weather Barriers.
D. Section 07 54 00 - Thermoplastic Membrane Roofing: Insulation specified as part of roofing system.
E. Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation inside interior walls and partitions.

1.03  REFERENCE STANDARDS


1.04  SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

PART 2  PRODUCTS

2.01  APPLICATIONS

A. Insulation Over Sheathed Metal Stud Framed Cavity Walls, Continuous: Rigid mineral fiber board.
B. Insulation in Exterior Metal Framed Walls: Batt insulation with no vapor retarder.

2.02  FIBER BOARD INSULATION MATERIALS

A. Mineral Fiber Board Insulation: Rigid mineral fiber, ASTM C612; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
   1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
   3. Manufacturers:
      a. ROXUL, Inc; ComfortBoard CIS: www.roxul.com; or approved equivalent.
2.03 BATT INSULATION MATERIALS

A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.

B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   7. Manufacturers:

C. Mineral Fiber Batt Insulation: Semi-rigid preformed batt, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
   1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
   3. Manufacturers:
      a. ROXUL, Inc; ComfortBatt: www.roxul.com; or approved equivalent.

2.04 ACCESSORIES

A. Insulation Fasteners for Batt Insulation: Impaling clip of galvanized steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

B. Mechanical Fasteners for Rigid Insulation: As recommended by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of irregularities.

3.02 CONTINUOUS BOARD INSTALLATION AT EXTERIOR CAVITY WALLS

A. Install board insulation in compliance with manufacturer's recommendations.

B. Install continuous rigid insulation in exterior cavity walls after weather barrier and related flashings have been applied to sheathing and have fully cured.
   1. Coordinate installation of continuous rigid insulation with installation of masonry veneer anchors.
   2. If masonry veneer anchor spacing (16 inches on center vertically and horizontally) in not adequate to fully secure insulation in accordance with manufacturer’s recommendations, provide additional mechanical fasteners as recommended by insulation manufacturer.

3.03 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions and as indicated on drawings.

B. Install in exterior wall spaces without gaps or voids. Install around window and door frames where voids exist. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
E. Retain insulation batts in place with spindle fasteners at 12 inches on center.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Water-Resistive Air Barriers: Materials that stop passage of water and air through exterior walls, to the degree specified, yet are water vapor permeable.

1.02 RELATED REQUIREMENTS
A. Section 03 30 00 - Cast-in-Place Concrete: Vapor barrier under concrete slabs on grade.
B. Section 04 20 01 - Masonry Veneer: Through-wall flashings.
C. Section 04 27 31 - Reinforced Unit Masonry: Masonry substrates to receive weather barrier.
D. Section 05 40 00 - Cold-Formed Metal Framing: Glass-mat-faced gypsum exterior wall sheathing.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
C. Shop Drawings: Provide drawings of special joint conditions.
D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.
E. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
F. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.05 QUALITY ASSURANCE
A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/sle:
   1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
   2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.06 MOCK-UP
A. Install weather barrier materials in mock-ups specified in Section 04 20 01.

1.07 FIELD CONDITIONS
A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

A. Water-Resistive Air Barrier: Provide at the following locations:
   1. On outside surface of inside wythe of exterior masonry cavity walls.
   2. On outside surface of sheathing of exterior masonry veneer and stucco walls.

2.02 WATER-RESISTIVE AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE)

A. Water-Resistive Air Barrier Coating: Cold-fluid-applied, vapor permeable, elastomeric waterproofing membrane.
   2. Adhesion to Glass-Mat-Faced Sheathing: Sufficient to ensure failure due to delamination of sheathing.
   3. Wet Film Thickness: 10 mils (0.010 inch), minimum.
   4. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
   5. Water Vapor Permeance: 5 perms, minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
   6. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure after application.
   7. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   9. VOC Content: 100 g per L or less.
   11. Products:
       c. Sto Corp.: StoGuard with Sto Gold Coat: www.stocorp.com.

2.03 AUXILIARY MATERIALS

A. Furnish primers, sealants, self-adhering transition membranes, tapes, flashings, and other auxiliary materials recommended by water-resistive air barrier coating manufacturer for intended use and compatible with the water-resistive air barrier membrane.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are suitable prior to commencing work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
B. Clean and prime substrate surfaces to receive weather barriers in accordance with manufacturer's instructions.
C. Prepare substrate in manner recommended by coating manufacturer.

3.03 INSTALLATION

A. Install weather barrier after sheathing joints and fastener heads are sealed and flashing is installed.
B. Install materials in accordance with manufacturer's instructions.
C. Install flashings, reinforcements, sealants, and other auxiliary materials as required in accordance with manufacturer's instructions.
D. Install flashings, end dams, and back dams at wall openings and penetrations in accordance with manufacturer's instructions.
1. Coordinate weather barrier installation with masonry flashings specified in Section 04 20 01.

E. Install weather barrier over exterior face of exterior wall substrates in accordance with manufacturer recommendations.

3.04 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Do not cover installed weather barriers until required inspections have been completed.
C. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
D. Take digital photographs of each portion of the installation prior to covering up.

3.05 PROTECTION
A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION
SECTION 07 42 64
METAL COMPOSITE MATERIAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Exterior cladding consisting of formed metal composite material (MCM) sheet, secondary supports, and anchors to structure, attached to solid backup.
B. Matching flashing and trim.

1.02 RELATED REQUIREMENTS
A. Section 05 40 00 - Cold-Formed Metal Framing: Panel support framing and sheathing.
B. Section 07 25 00 - Weather Barriers: Weather barrier behind aluminum composite panel systems.
C. Section 07 92 00 - Joint Sealants: Sealing joints between aluminum composite panel systems and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS
C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Pre-Installation Meeting: Convene one week before starting work of this section to verify project requirements, co-ordinate with installers of other work, establish condition and completeness of
building substrate, and review manufacturers' installation instructions and warranty requirements.
1. Require attendance by the installer and relevant sub-contractors.
2. Include MCM sheet manufacturer's representative and wall system manufacturer's representative to review storage and handling procedures.
3. Review in detail truck transportation, parking, vertical transportation, schedule, personnel, installation of adjacent materials and substrate.
4. Review procedures for protection of work and other construction.
5. Review safety precautions.

1.05 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data - MCM Sheets: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics, and finish, and:
   1. Finish manufacturer's data sheet showing physical and performance characteristics.
   2. Storage and handling requirements and recommendations.
   3. Fabrication instructions and recommendations.
   4. Specimen warranty for finish, as specified herein.
C. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions and recommendations.
   4. Specimen warranty for wall system, as specified herein.
D. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Indicate panel numbering system.
   2. Differentiate between shop and field fabrication.
   3. Indicate substrates and adjacent work with which the wall system must be coordinated.
   4. Include large-scale details of anchorages and connecting elements.
   5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches.
   6. Include design engineer's stamp or seal on shop drawings for attachments and anchors.
E. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
F. Verification Samples: For each finish product specified, minimum size 12 inches square, representing actual product in color and texture.
G. Certificate: Certify that the work results of this section meet or exceed specified requirements.
H. Design Data: Submit structural calculations stamped by design engineer, for Contracting Officer's Representative's information and project record.
I. Manufacturer's Field Reports: Provide within 48 hours of field review. State what was observed and what changes, if any, were requested or required.
J. Manufacturer's Qualification Statement.
K. Installer's Qualification Statement.
L. Maintenance Data: Care of finishes and warranty requirements.
M. Executed Warranty: Submit warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE
A. Field Measurements: Verify actual dimensions by field measurement before fabrication; show recorded measurements on shop drawings.
B. Design Engineer’s Qualifications: Design structural supports and anchorages under direct supervision of a Structural Engineer experienced in design of this type of Work and licensed in the State in which the Project is located.

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
   1. With not less than three (3) years of documented experience.
   2. Approved by MCM sheet manufacturer.
   3. Submit contact names and phone numbers for at least three references connected with successful past projects.

D. Installer Qualifications: Company specializing in performing work of the type specified in this section.
   1. With minimum three (3) years of documented experience.
   2. Approved by wall system manufacturer.
   3. Submit contact names and phone numbers for at least three references connected with successful past projects.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer’s original, unopened, undamaged containers with identification labels intact.
   1. Protect finishes by applying heavy duty removable plastic film during production.
   2. Package for protection against transportation damage.
   3. Provide markings to identify components consistently with drawings.
   4. Exercise care in unloading, storing and installing panels to prevent bending, warping, twisting and surface damage.

B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Store in well ventilated space out of direct sunlight.
   2. Protect from moisture and condensation with tarpaulins or other suitable weather tight covering installed to provide ventilation.
   3. Store at a slope to ensure positive drainage of any accumulated water.
   4. Do not store in any enclosed space where ambient temperature can exceed 120 degrees F.
   5. Avoid contact with any other materials that might cause staining, denting, or other surface damage.

1.08 WARRANTY

A. See Section 01 77 00 - Project Closeout, for additional warranty requirements.

B. Wall System Warranty: Provide joint written warranty by manufacturer and installer, agreeing to correct defects in manufacturing or installation within a two year period after Date of Substantial Completion.

C. MCM Sheet Manufacturer’s Finish Warranty: Provide manufacturer’s written warranty stating that the finish will perform as follows for minimum of 20 years:
   1. Chalking: No more than that represented by a No. 8 rating based on ASTM D4214.
   2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Composite Material Sheet Manufacturers:
B. Wall Panel System Manufacturers:

2.02 WALL PANEL SYSTEM
A. Wall Panel System: Metal panels, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage or failure.
1. Provide structural design by or under direct supervision of a Structural Engineer licensed in the State in which the Project is located.
2. Provide panel jointing and weatherseal using reveal joints and gaskets but no sealant.
3. Anchor panels to supporting framing without exposed fasteners.

B. Performance Requirements:
1. All tests are to be on full-size mock-ups; tests performed previously for other projects are acceptable provided tested assemblies are truly equivalent to those to be used on this project, unless otherwise indicated.
2. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F to 180 degrees F without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.
3. Wind Performance: Provide system tested in accordance with ASTM E330/E330M without permanent deformation or failures of structural members under the following conditions:
   b. Inward Design Wind Pressure: 56 psf.
   c. Outward Design Wind Pressure: 56 psf.
   d. Maximum deflection of perimeter framing member of L/175 or 3/4", whichever is less, normal to plane of the wall; maximum deflection of individual panels of L/60.
   e. Maximum anchor deflection in any direction of 1/16 inch at connection points of framing members to anchors.
4. Air Infiltration: 0.06 cfm/sq ft of wall area, maximum, when tested at 1.57 psf in accordance with ASTM E283.
5. Water Penetration: No water penetration under static pressure when tested in accordance with ASTM E331 at a differential of 10 percent of inward acting design load, 6.24 psf minimum, after 15 minutes.
   a. Water penetration is defined as the appearance of uncontrolled water on the interior face of the wall.
   b. Design to drain leakage and condensation to the exterior face of the wall.

C. Panels: One inch deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
1. Reinforce corners with riveted aluminum angles.
2. Provide concealed attachment to supporting structure by adhering attachment members to back of panel; attachment members may also function as stiffeners.
3. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
4. Secure members to back face of panels using structural silicone sealant approved by MCM sheet manufacturer.
5. Fabricate panels under controlled shop conditions.
6. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
7. Fabricate as indicated on drawings and as recommended by MCM sheet manufacturer.
   a. Make panel lines, breaks, curves and angles sharp and true.
   b. Keep plane surfaces free from warp or buckle.
   c. Keep panel surfaces free of scratches or marks caused during fabrication.
8. Provide joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on inside face of panel system.
9. For "dry" jointing, secure extrusions to returned pan edges with stainless steel rivets; provide means of concealed drainage with baffles and weeps for water that might accumulate in members of system.

2.03 MATERIALS
A. Metal Composite Material (MCM) Sheet: Two sheets of aluminum sandwiching a core of extruded thermoplastic material; no foamed insulation material content.
   1. Overall Sheet Thickness: 4 mm, minimum.
   2. Face Sheet Thickness: 0.019 inches, minimum.
   3. Alloy: Manufacturer's standard, selected for best appearance and finish durability.
   4. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.
   5. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   6. Flammability: Self-ignition temperature of 650 degrees F or greater, when tested in accordance with ASTM D1929.
   7. Factory Finish: Two or three coat fluoropolymer resin coating, approved by the coating manufacturer for the length of warranty specified for the project, and applied by coil manufacturing facility that specializes in coil applied finishes.
      b. Long-Term Performance: Not less than that specified under WARRANTY in PART 1.
   8. Color/Texture: As selected by Contracting Officer's Representative from manufacturer's standard range.
B. Metal Framing Members: Include sub-girts, zee-clips, base and sill angles and channels, hat-shaped and rigid channels, and furring channels required for complete installation.
   1. Provide material strength, dimensions, configuration as required to meet the applied loads applied and in compliance with applicable building code.
   2. Aluminum Components: ASTM B209 (ASTM B209M); or ASTM B221 (ASTM B221M).
C. Flashing: Sheet aluminum; 0.040 inch thick, minimum; finish and color to match MCM sheet.
D. Anchors, Clips and Accessories:
E. Fasteners:
   1. Exposed Fasteners: Stainless steel; permitted only where absolutely unavoidable and subject to prior approval of the Contracting Officer's Representative.
   2. Screws: Self-drilling or self-tapping Type 410 stainless steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal wall panels.
   4. Fasteners for Flashing and Trim: Blind fasteners of high-strength aluminum or stainless steel.
F. Joint Sealer: Clear silicone sealant approved by MCM sheet manufacturer.
G. Provide panel system manufacturer's and installer's stainless steel accessories, including fasteners, clips, anchorage devices and attachments.
PART 3  EXECUTION

3.01  EXAMINATION
A. Verify dimensions, tolerances, and interfaces with other work.
B. Verify substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturers written instructions.
C. If substrate preparation is the responsibility of another installer, notify Contracting Officer's Representative of unsatisfactory preparation before proceeding.
D. Notify Contracting Officer’s Representative in writing of conditions detrimental to proper and timely completion of work. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. Protect adjacent work areas and finish surfaces from damage during installation.

3.03 INSTALLATION
A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.
B. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.
C. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer’s instructions for installation of concealed fasteners.
D. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.
E. Do not form panels in field unless required by wall system manufacturer and approved by the Contracting Officer's Representative; comply with MCM sheet manufacturer's instructions and recommendations for field forming.
F. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.
G. Where joints are designed for field applied sealant, seal joints completely with specified sealant.
H. Install flashings as indicated on shop drawings At flashing butt joints, provide a lap strap under flashing and seal lapped surfaces with a full bed of non-hardening sealant.
I. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:
   1. Variation From Plane or Location: 1/2 inch in 30 feet of length and up to 3/4 inch in 300 feet, maximum.
   2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet run, maximum.
   3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet run, maximum.
   4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch, maximum.
J. Replace damaged products.
   1. Exception: Field repairs of minor damage to finishes are permitted only when approved in writing by Contracting Officer's Representative, panel manufacturer, and fabricator.
   2. Field Repairs to Finishes: Using materials and methods sufficient that repairs are not discernible when viewed at distance of 10 feet under all typical light conditions experienced at the project.

3.04 FIELD QUALITY CONTROL
A. Wall System Manufacturer’s Field Services: Provide field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with instructions.
B. Site Visits: Schedule two site visits during execution of installation.

3.05 CLEANING
A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.
B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.
C. Remove temporary coverings and protection of adjacent work areas.
D. Clean installed products in accordance with manufacturer's instructions.

3.06 PROTECTION
A. Protect installed panel system from damage during construction.
SECTION 07 54 00
THERMOPLASTIC MEMBRANE ROOFING

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Adhered system with thermoplastic roofing membrane.
   1. Location: Horizontal roof and vertical parapet wall surfaces.
B. Insulation, flat and tapered.
C. Overlay board.
   1. Location: Install over flat and tapered insulation on horizontal surfaces.
D. Metal roof edgings and flashings.
E. Metal thru-wall scuppers.
F. Roofing stack boots and walkway pads.

1.02  RELATED REQUIREMENTS

A. Section 05 31 00 - Steel Decking.
B. Section 06 10 00 - Rough Carpentry: Wood nailers; wall sheathing at vertical parapet wall surfaces to receive TPO roofing membrane.
C. Section 07 71 00 - Roof Specialties: Copings.
D. Section 07 71 23 - Manufactured Gutters and Downspouts: Gutters and downspouts, conductor heads.

1.03  REFERENCE STANDARDS


1.04  ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.05  SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, overlay board, walkway pads, fasteners, and adhesives.
C. Specimen Warranty: For approval.
D. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and mechanical fastener layout.
E. Samples for Verification: Submit two samples 6 x 6 inches in size illustrating insulation and TPO membrane.
F. Manufacturer's Installation Instructions: Indicate membrane seaming precautions, special procedures, and perimeter conditions requiring special attention.
G. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
H. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
I. Warranty:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

1.06 QUALITY ASSURANCE
A. Perform work in accordance with NRCA ML104.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section:
   1. With minimum 3 years documented experience.
   2. Approved by membrane manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
B. Store products in weather protected environment, clear of ground and moisture, and complying with manufacturer's temperature requirements.
C. Protect foam insulation from direct exposure to sunlight.

1.08 FIELD CONDITIONS
A. Do not apply roofing membrane during unsuitable weather.
B. Comply with manufacturer's environmental requirements for installation of membrane, adhesives, sealants, and hot air welding.
C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.09 WARRANTY
A. See Section 01 77 00 - Project Closeout, for additional warranty requirements.
B. System Warranty: Provide manufacturer's No Dollar Limit (NDL) Total System warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. Warranty Term: 20 years.
   2. For repair and replacement include costs of both material and labor in warranty.
   4. Exceptions NOT Permitted:
a. Hail up to 2 inches in diameter.
5. Metal Roof Edging/Fascia: Include roof edge system in full-system warranty, covering blow-off from winds up to 120 mph.
6. The manufacturer shall provide documentation certifying that the roof design provided complies with the performance requirements, for that particular system, as set forth in IBC Chapter 15, Section 1504.
   a. The documentation shall be attached to the roof system warranty provided at the closeout of the project.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Thermoplastic Polyolefin (TPO) Membrane Materials:

B. Insulation:
   1. Carlisle SynTec; SecurShield Polyiso: www.carlisle-syntec.com/sle.

C. Overlay Board:

2.02 ROOFING

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over overlay board, over two layers of insulation, over metal deck.

B. Roofing Assembly Requirements:
      a. Field applied coating may not be used to achieve specified SRI.
   2. Roof Covering External Fire Resistance Classification: UL (FRD) Class A.
   4. Wind Resistance: Provide roof system meeting the wind load requirements of ASCE 7 as follows:
      a. Design Wind Velocity: 120 mph.
      b. Submit report prepared by an Engineer registered in the state in which the project is located, certifying that the roof system will withstand applicable wind loading requirements of ASCE 7.
   5. Insulation Thermal Value (R), minimum: 25; provide insulation of thickness required.

C. Acceptable Insulation Types - Constant Thickness Application:
   1. Minimum 2 layers of polyisocyanurate board.
   2. Cover insulation with one layer of glass mat faced gypsum overlay board or high-density polyiso insulation board.
D. Acceptable Insulation Types - Tapered Application:
   1. Tapered polyisocyanurate board.
   2. Cover insulation with one layer of glass mat faced gypsum overlay board or high-density polyiso insulation board.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:
   1. Material: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M.
   3. Thickness: 0.060 inch, minimum.
   4. Sheet Width: Factory fabricated into required sheet widths.
   5. Solar Reflectance: 0.76, minimum, initial, and 0.68, minimum, after 3-years (uncleaned), certified by Cool Roof Rating Council.
   6. Thermal Emissivity: 0.90, minimum, initial, and 0.86, minimum, after 3-years (uncleaned), certified by Cool Roof Rating Council.
   7. Coating over Scrim: 22 mil, minimum, per ASTM D7635.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Flexible Flashing Material: Material recommended by membrane manufacturer.

2.04 WALL SHEATHING

A. Parapet Wall Sheathing: 5/8-inch exterior-grade plywood as specified in Section 06 10 00.

2.05 INSULATION

A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type II, Class 2, polymer bonded glass fiber mat both faces; and with the following characteristics:
   1. Compressive Strength: 16 psi minimum.
   2. Board Size: 48 by 96 inch.
      a. Tapered Insulation: 48 x 48 inch.
   3. Individual Board Thickness: 1-1/2 inch minimum.
   4. Tapered Board: Slope as indicated; minimum thickness 1-1/2 inch; minimum slope 1/4 inch per foot; fabricate of fewest layers possible.

2.06 OVERLAY BOARD

A. Overlay Board: Provide one of the following types of overlay board, as approved by roof membrane manufacturer:
   1. Polyiso Overlay Board: Rigid insulation panel complying with ASTM C1289, Type II, Class 2, polymer bonded glass fiber mat both faces; composed of a high-density, closed-cell polyisocyanurate foam core laminated to coated-glass fiber-mat facers for use as a cover board or recover board.
      a. Board Size: 48 x 96 inches.
      b. Board Thickness: 1/2 inch.
      c. Compressive Strength: 80 psi minimum.
      d. Thermal Resistance: R-value of 2.5.
      a. Products: Equivalent to the following:
         1) Georgia-Pacific DensDeck Prime: www.densdeck.com; or approved equivalent.

2.07 METAL ACCESSORIES

A. Metal Roof Edging and Fascia: Continuous metal edge member serving as termination of roof membrane and retainer for metal fascia; watertight with no exposed fasteners; mounted to roof edge nailer.
1. Wind Performance:
   c. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-190 rating.
2. Fascia Face Height: As indicated.
3. Fascia Material and Finish: 0.040 inch thick formed aluminum or 24 gage galvanized steel, Kynar 500 finish in manufacturer's standard color; matching concealed joint splice plates; factory-installed protective plastic film.
4. Length: 144 inches.
5. Functional Characteristics: Fascia retainer supports while allowing for free thermal cycling of fascia.
6. Fasteners: Factory-provided corrosion resistant fasteners, with drivers; no exposed fasteners permitted.
7. Special Shaped Components: Provide factory-fabricated pieces necessary for complete installation, including miters and end caps; minimum 14 inch long legs on corner pieces.

B. Miscellaneous Metal Fabrications and Flashings: TPO-Coated Metal as recommended by membrane manufacturer.
2. TPO Coating Color: White.

C. Copings: As specified in Section 07 71 00.

D. Gutters, Downspouts, Conductor Heads and Thru-Wall Scuppers: As specified in Section 07 71 23.

2.08 ACCESSORIES
A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
B. Cant and Edge Strips: Wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.
C. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches wide; self adhering.
D. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
E. Membrane Adhesive: As recommended by membrane manufacturer.
F. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
G. Thinner and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
H. Overlay Board Adhesive: As recommended by insulation manufacturer.
I. Roofing Fasteners: Non-ferrous type, size and configuration as required to suit application and as recommended by membrane manufacturer.
J. Termination Bars: Extruded aluminum with pre-punched holes at 4 inches on center, and as recommended by membrane manufacturer.
K. Sealants: As recommended by membrane manufacturer.
L. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visibly distinctive from roof membrane.
   2. Surface Color: White, light gray, or yellow.
PART 3  EXECUTION

3.01  INSTALLATION - GENERAL
   A. Perform work in accordance with NRCA ML104 and manufacturer's instructions.
   B. Do not apply roofing membrane during unsuitable weather.
   C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
   D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
   E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
   F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

3.02  EXAMINATION
   A. Verify that surfaces and site conditions are ready to receive work.
   B. Verify deck is supported and secure.
   C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
   D. Verify deck surfaces are dry and free of snow or ice.
      1. New galvanized steel deck surfaces shall be power washed if finishing oils are present.
   E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips and reglets are in place.

3.03  INSULATION - UNDER MEMBRANE
   A. Install insulation, tapered insulation, and overlay board in accordance with manufacturer's instructions.
   B. Attachment of Insulation: Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions.
      1. For code compliance, provide fastening density as required depending upon project wind speed and wind uplift requirements.
   C. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.
   D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions and approved shop drawings.
      1. Provide tapered insulation crickets at rooftop HVAC units and other roof areas indicated.
   E. Install overlay board over insulation, tapered insulation, and crickets; with joints staggered minimum 6 inches from joints of the preceding layer.
      1. Mechanically fasten all layers simultaneously in accordance with roofing manufacturer's instructions and code requirements.
   F. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
   G. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
   H. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.
   I. Do not apply more insulation than can be covered with membrane in same day.

3.04  MEMBRANE APPLICATION
   A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
   B. Shingle joints on sloped substrate in direction of drainage.
C. Fully Adhered Application: Apply adhesive to substrate at rate recommended by membrane manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
   1. Roll the membrane with a weighted steel roller as recommended by the membrane manufacturer to set the membrane into the adhesive.
D. Overlap edges and ends and seal seams by heat welding, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to field-cut edges.
E. At intersections with vertical surfaces:
   1. Extend membrane up a minimum of 8 inches onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to termination bar.
   3. Secure top edge of flashing with termination bar fastened to substrate at 4 inches on center.
F. Around roof penetrations, seal flanges and flashings with flexible flashing in accordance with membrane manufacturer's instructions.
G. At roof edges, extend membrane over edge and secure with metal roof edging or termination bar in accordance with membrane manufacturer's recommendations.
H. Install walkway pads in accordance with manufacturer's instructions. Space pad joints to permit drainage.

3.05 FLASHING AND ACCESSORIES INSTALLATION

A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.
B. Metal Accessories: Install metal edgings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
   1. Follow roofing manufacturer's instructions.
   2. Remove protective plastic surface film immediately before installation.
   3. Install water block sealant under the membrane anchorage leg.
   4. Flash with manufacturer's recommended flashing sheet unless otherwise indicated.
   5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
C. Flashing at Walls, Curbs, and Other Vertical and Sloped Surfaces: Install weathertight flashing at all walls, curbs, parapets, and other vertical and sloped surfaces that the roofing membrane abuts to; extend flashing at least 8 inches high above membrane surface.
   1. Use the longest practical flashing pieces.
   2. Evaluate the substrate and overlay and adjust installation procedure in accordance with membrane manufacturer's recommendations.
   3. Complete the splice between flashing and the main roof sheet with specified splice adhesive before adhering flashing to the vertical surface.
   4. Provide termination directly to the vertical substrate as shown on roof drawings and in accordance with membrane manufacturer's recommendations.
D. Flashing at Penetrations: Flash all penetrations passing through the membrane; make flashing seals directly to the penetration.
   1. Pipes, Round Supports, and Similar Items: Flash with specified pre-molded pipe flashings.
   2. Pipe Clusters and Unusual Shaped Penetrations: Provide penetration pocket at least 2 inches deep, with at least 1 inch clearance from penetration, sloped to shed water.
   3. Structural Steel Tubing: If corner radii are greater than 1/4 inch and longest side of tube does not exceed 12 inches, flash as for pipes; otherwise, provide a standard curb with flashing.
   4. Flexible and Moving Penetrations: Provide weathertight gooseneck set in sealant and secured to deck, flashed as recommended by manufacturer.
   5. High Temperature Surfaces: Where the in-service temperature is, or is expected to be, in excess of 180 degrees F, protect the elastomeric components from direct contact with the
hot surfaces using an intermediate insulated sleeve as flashing substrate as recommended by membrane manufacturer.

E. Thru-Wall Scuppers: Install thru-wall scupper boxes with continuous flanges with rounded corners, fabricated of TPO-coated metal and installed in accordance with membrane manufacturer’s recommendations.
   1. Coordinate scupper installation with conductor head and downspout installation specified in Section 07 71 23.

3.06 FINISHING UNBALLASTED SURFACES
A. Install walkway pads. Space pad joints to permit drainage. Comply with manufacturer's installation recommendations.

3.07 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for general requirements for field quality control and inspection.
B. Require site attendance of roofing membrane manufacturer at job start, at least one interim inspection, and final inspection, during installation of the Work.
C. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).
D. Perform all corrections necessary for issuance of warranty.

3.08 CLEANING
A. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.
B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
C. Repair or replace defaced or damaged finishes caused by work of this section.

3.09 PROTECTION
A. Protect installed roofing and flashings from construction operations.
B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Prefabricated reglets and counterflashing.
   B. Miscellaneous fabricated sheet metal items and accessories.
   C. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS
   A. Section 04 20 01 - Masonry Veneer: Through-wall flashings in cavity walls.
   B. Section 04 27 31 - Reinforced Unit Masonry: Through-wall flashings in masonry.
   C. Section 06 10 00 - Rough Carpentry: Wood nailers for sheet metal work.
   D. Section 07 54 00 - Thermoplastic Membrane Roofing: Metal roof edging and fascia, metal thru-wall scuppers.
   E. Section 07 71 00 - Roof Specialties: Manufactured copings.
   F. Section 07 71 23 - Manufactured Gutters and Downspouts: Gutters and downspouts, conductor heads.
   G. Section 07 92 00 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.03 REFERENCE STANDARDS
   B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Provide data on manufactured items, shape of components, materials and finishes, anchor types and locations.
   C. Shop Drawings: Indicate material configurations and dimensions, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
   D. Samples: Submit two samples illustrating metal finish color.

1.05 QUALITY ASSURANCE
   A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.
   B. Installer Qualifications: Company specializing in sheet metal work with three years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
   B. Prevent contact with materials that could cause discoloration or staining.
PART 2 PRODUCTS

2.01 SHEET MATERIALS
A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage (0.0239) inch thick base metal, shop pre-coated with PVDF coating.
   1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
      a. Color: As selected by Contracting Officer's Representative from manufacturer's standard colors.

2.02 ACCESSORIES
A. Fasteners: Stainless steel, with soft neoprene washers.
B. Protective Backing Paint: Asphaltic mastic, ASTM D 4479 Type I.
C. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
D. Sealant to be Exposed in Completed Work: Silicone sealant as specified in Section 07 92 00.
E. Lead Wedges: As recommended by masonry reglet manufacturer for cut-in installations.

2.03 PREFABRICATED REGLETS AND COUNTERFLASHING
A. Masonry Type: Provide the following, or approved equivalent:
      a. Material: 0.0239 inch (24 gage) galvanized steel.
         1) Finish: Factory applied Kynar 500/Hylar 500 finish.
         2) Color: As selected from manufacturer's standard colors.
      b. Provide factory-manufactured mitered and sealed inside and outside corners.
      c. Provide "Type MA" reglet (1-1/2-inch top flange) for building into brick walls or cutting into masonry walls.
      d. Provide "Type MA-4" reglet (4-inch top flange) for building into concrete block walls.

2.04 FABRICATION
A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Fabricate hold-down cleats of same material as counterflashings, in continuous lengths matching counterflashings lengths.
C. Form pieces in longest possible lengths.
D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
E. At moving joints, use sealed lapped seams.
F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
G. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION
A. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION
A. Conform to drawing details.
B. Install prefabricated reglets and counterflashings in accordance with manufacturer's instructions.
C. Install reglets to heights indicated on drawings. Lap ends 1 inch at stamped offset.
D. At cut-in reglets, secure reglets in place with tightly-packed lead wedges and seal top of reglet to face of wall with silicone sealant.

E. Install counter flashings into reglets in accordance with manufacturer's instructions. Use factory-fabricated inside and outside corners.
   1. Verify that flashings are not bent or deformed.
   2. Install factory-fabricated inside and outside corners before installing straight lengths.

F. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

G. Seal metal joints watertight.

3.04 FIELD QUALITY CONTROL
A. See Section 01 40 00 - Quality Requirements, for field inspection requirements.
B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.
PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Manufactured roof specialties, including copings.

1.02 RELATED REQUIREMENTS
   A. Section 06 10 00 - Rough Carpentry: Wood blocking and nailers.
   B. Section 07 54 00 - Thermoplastic Membrane Roofing: Metal roof edging and fascia, metal thru-wall scuppers.
   C. Section 07 62 00 - Sheet Metal Flashing and Trim: Reglets and counterflushing.
   D. Section 07 71 23 - Manufactured Gutters and Downspouts: Gutters and downspouts, conductor heads.
   E. Section 07 92 00 - Joint Sealants.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
   C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
   D. Samples: Submit two appropriately sized samples of coping, illustrating component shape, finish and color.
   E. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.
   F. Warranty: Submit executed copy of warranty.

1.05 QUALITY ASSURANCE
   A. Coping system shall be certified by the manufacturer to meet performance design criteria according to the following test standard:
      1. ANSI/SPRI ES-1 Test RE-3 for Coping: The coping system shall be tested simultaneously on horizontal and vertical surfaces and shall exceed horizontal and vertical design wind pressures as calculated in accord with the ANSI/SPRI ES-1 Test RE-3.
         a. Design Wind Load: 120 mph.

1.06 WARRANTY
   A. Manufacturer's Special Performance Warranty: Provide coping manufacturer's warranty agreeing to repair or replace the coping system if it is damaged or blown off due to wind conditions up to 120 mph.
      1. Warranty Term: 20 years.
      2. For repair or replacement, include costs of both material and labor in warranty.

PART 2 PRODUCTS
2.01 COMPONENTS
   A. Copings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness and finish as cap; concealed stainless steel fasteners.
2. Pull-Off Resistance: Tested in accordance with SPRI ES-1 RE-3 to positive and negative design wind pressure as defined by applicable code.
3. Material: Formed steel sheet, galvanized, 24 gage, 0.024 inch thick, minimum.
4. Finish: 70 percent polyvinylidene fluoride.
5. Color: To be selected by Contracting Officer's Representative from manufacturer's standard range.
6. Manufacturers:

B. Anchors and Supports; Profiled to suit copings.
1. Anchoring Devices: Type recommended by fabricator.

2.02 ACCESSORIES
   A. Sealant for Joints in Linear Components: As recommended by component manufacturer.

2.03 FINISHES
   A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that parapets, roof membrane, flashings, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION
   A. Install components in accordance with manufacturer's instructions.
      1. Install copings to achieve code-required wind speed and wind uplift compliance.
   B. Seal joints within components when required by component manufacturer.
   C. Anchor components securely.
   D. Coordinate installation of components of this section with installation of roofing membrane and flashings.
   E. Coordinate installation of sealants with work of this section to ensure water tightness.

END OF SECTION
SECTION 07 71 23
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Pre-finished galvanized steel gutters and downspouts associated with thermoplastic membrane roofing.
   B. Post-finished aluminum conductor heads and pre-finished aluminum downspouts.

1.02 RELATED REQUIREMENTS
   A. Section 05 50 00 - Metal Fabrications: Downspout boots.
   B. Section 06 10 00 - Rough Carpentry: Wood blocking and nailers.
   C. Section 07 54 00 - Thermoplastic Membrane Roofing: Metal roof edging and fascia, metal thru-wall scuppers.
   D. Section 07 62 00 - Sheet Metal Flashing and Trim: Reglets and counterflushing.

1.03 REFERENCE STANDARDS
   C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Provide data on prefabricated components.
   C. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
   D. Samples: Submit two samples, 6 inch long illustrating component design, finish, color, and configuration.

1.05 QUALITY ASSURANCE
   A. Gutter system shall be certified by the manufacturer to have been tested to meet the requirements of ANSI/SPRI Standard GD-1.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
   B. Prevent contact with materials that could cause discoloration, staining, or damage.

1.07 WARRANTY
   A. See Section 01 77 00 - Project Closeout, for additional warranty requirements.
   B. Manufacturer's Special Performance Warranty: Provide gutter manufacturer’s warranty agreeing to repair or replace the gutter system if it is damaged or blown off due to wind conditions up to 120 mph.
      1. Warranty Term: 20 years.
      2. For repair or replacement include costs of both material and labor in warranty.
PART 2 PRODUCTS

2.01 MATERIALS
A. Pre-Finished Galvanized Steel Sheet: ASTM A653/A653M, with G90/Z275 zinc coating.
   1. Thickness:
      b. Downspouts: 24 gage.
   2. Finish: Shop pre-coated with PVDF (polyvinylidene fluoride) coating.
   3. Color: As selected from manufacturer's standard colors.
B. Aluminum Sheet: ASTM B209 (ASTM B209M); 0.050 inch thick.
   1. Finish: Mill.

2.02 COMPONENTS
A. Gutters: Offset profile.
   1. Manufacturer:
   2. Sizes: As indicated on drawings.
      a. Gutter face height shall be 1-1/2 inches less than edge of adjacent roof.
   4. Brackets: 1 inch wide, 2-piece, extruded aluminum internal brackets located at 24 inches on center.
   5. Expansion Joints: Provide prefabricated expansion joints at intervals not exceeding 40 feet maximum for long runs, at locations as recommended by manufacturer.
   6. Accessories: Provide corners, end caps, expansion joints, etc., fabricated by the gutter manufacturer.
B. Conductor Heads: Profile and size as indicated on drawings.
      a. Thickness: .050 inch.
      b. Finish: Post-finished Kynar.
   2. Manufacturer: Hickman: www.wph.com; or approved equivalent.
   3. Note: The thru-wall scupper shall be provided by the thermoplastic membrane roofing manufacturer. Coordinate that work with provision of the conductor head under this section, and provide a watertight transition between the two.
C. Downspouts:
   1. Manufacturer:
   2. Material:
      a. At Gutters: Pre-finished galvanized steel sheet.
      b. At Conductor Heads: Pre-finished aluminum sheet.
   3. Sizes: As indicated on drawings.
   4. Accessories:
      a. Provide factory-fabricated starter tubes and elbows as required for each downspout.
      b. Provide adapters as necessary to connect downspouts to downspout boots.
         1) Coordinate with downspout boots provided under Section 05 50 00.
D. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Anchoring Devices: Type recommended by fabricator.
   2. Gutter Supports: Brackets as indicated.
   3. Downspout Supports: Straps, 1 inch wide.
      a. Space straps at distances not to exceed 6'-0".
E. Fasteners: Same material and finish as gutters and downspouts, with soft neoprene washers.
2.03 FABRICATION
   A. Form gutters and downspouts of profiles and sizes indicated.
   B. Fabricate with required connection pieces.
   C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
   D. Hem exposed edges of metal.

2.04 FINISHES
   A. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that surfaces are ready to receive work.

3.02 PREPARATION
   A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION
   A. Install gutters, conductor heads, downspouts, and accessories in accordance with manufacturer's instructions.
   B. Connect downspouts to downspout boots at 12 inches above grade. Grout connection watertight.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Firestopping systems.
   B. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS
   A. Section 01 14 50 - Cutting and Patching.
   B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS
   C. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestops; 2014.
   F. ITS (DIR) - Directory of Listed Products; current edition.
   I. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
   C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
   D. Sustainable Design Submittal: Submit VOC content documentation for all non-preformed materials.
   E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
   F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   G. Certificate from authority having jurisdiction indicating approval of materials used.
   H. Installer Qualification: Submit qualification statements for installing mechanics.

1.05 QUALITY ASSURANCE
   A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
      1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
      2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
      3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
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 and:
   1. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:
   2. With minimum 3 years documented experience installing work of this type.
   3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
   4. Licensed by authority having jurisdiction.
   5. Approved by firestopping manufacturer,

1.06 MOCK-UP
   A. Install one firestopping assembly representative of each fire rating design required on project.
      1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
      2. Where firestopping is intended to fill a linear opening, install minimum of 1 linear ft.
   B. Obtain approval of authorities having jurisdiction (AHJ) before proceeding.
   C. If accepted, mock-up will represent minimum standard for the Work.
   D. If accepted, mock-up may remain as part of the Work. Remove and replace mock-ups not accepted.

1.07 FIELD CONDITIONS
   A. Comply with firestopping manufacturer’s recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
   B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING - GENERAL REQUIREMENTS
   A. Manufacturers:
      2. 3M Fire Protection Products: www.3m.com/firestop
      3. Hilti, Inc: www.us.hilti.com/#sle
   B. Firestopping: Any material meeting requirements.
   C. Firestopping Materials with Volatile Content: Provide only products having lower volatile organic compound (VOC) content than required by SCAQMD 1168.
   D. Mold Resistance: Provide firestopping materials with mold and mildew resistance rating of 0 as determined by ASTM G21.
   E. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.
   F. Fire Ratings: Refer to drawings for required systems and ratings.

2.02 FIRESTOPPING ASSEMBLY REQUIREMENTS
   A. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
      1. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.03 FIRESTOPPING SYSTEMS
   A. Firestopping: Any material meeting requirements.
      1. Fire Ratings: Use any system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814 or ASTM E119 with F Rating equal to fire rating of
penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION
   A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
   B. Remove incompatible materials that could adversely affect bond.
   C. Install backing or damming materials to arrest liquid material leakage.

3.03 INSTALLATION
   A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
   B. Do not cover installed firestopping until inspected by Owner's Independent Testing Agency.
   C. Do not cover installed firestopping until inspected by authorities having jurisdiction.
   D. Install labeling required by code.

3.04 FIELD QUALITY CONTROL
   B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.05 CLEANING
   A. Clean adjacent surfaces of firestopping materials.

3.06 PROTECTION
   A. Protect adjacent surfaces from damage by material installation.

END OF SECTION
SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Joint sealants for the following locations:
   1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:
      a. Control joints in masonry walls.
      b. Control and expansion joints in cast-in-place concrete.
      c. Perimeter joints between adjacent materials and frames of doors and windows.
      d. Other joints as indicated.
   2. Exterior joints in horizontal traffic surfaces as indicated below:
      a. Control, expansion, and isolation joints in cast-in-place concrete slabs.
      b. Other joints as indicated.
   3. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:
      a. Control and expansion joints on exposed interior surfaces of exterior walls.
      b. Perimeter joints of exterior openings where indicated.
      c. Tile control and expansion joints.
      d. Perimeter joints between interior wall surfaces and frames of interior doors.
      e. Perimeter joints of plumbing fixtures.
      f. Other joints as indicated.
   4. Interior joints in horizontal traffic surfaces as indicated below:
      a. Control and expansion joints in cast-in-place concrete slabs.
      b. Other joints as indicated.

1.02 RELATED REQUIREMENTS

A. Section 07 62 00 - Flashing and Sheet Metal: Sealing joints related to flashing and sheet metal for roofing.
B. Section 07 84 00 - Firestopping: Firestopping sealants.
C. Section 08 80 00 - Glazing: Sealants used in glazing.
D. Section 09 21 16 - Gypsum Board Assemblies: Sealing concealed perimeter joints of gypsum board partitions to reduce sound transmission.
E. Section 09 30 00 - Tiling: Sealing tile joints.
F. Section 09 51 00 - Acoustical Ceilings: Sealing edge moldings at perimeter of acoustical ceilings.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
B. Provide joint sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water resistant and cause no staining or deterioration of joint substrates.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product data from manufacturers for each joint sealant product required.
C. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
D. Samples for initial selection purposes in form of manufacturer's standard bead samples, consisting of strips of actual products showing full range of colors available, for each product exposed to view.
E. Certificates from manufacturers of joint sealants attesting that their products comply with specification requirements and are suitable for the use indicated.

F. Product test reports for each type of joint sealants indicated, evidencing compliance with requirements specified.

1.05 QUALITY ASSURANCE
A. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer’s recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.07 PROJECT CONDITIONS
A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
   2. When joint substrates are wet.

B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.08 SEQUENCING AND SCHEDULING
A. Sequence installation of joint sealants to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise indicated.

PART 2 - PRODUCTS
2.01 MATERIALS, GENERAL
A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors: Provide color of exposed joint sealants to comply with the following:
   1. Provide selections made by Contracting Officer from manufacturer’s full range of standard colors for products of type indicated.

2.02 ELASTOMERIC JOINT SEALANTS
A. Elastomeric Sealant Standard: Provide manufacturer’s standard chemically curing elastomeric sealants that comply with ASTM C 920, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.

B. Exterior joints in vertical surfaces and nontraffic horizontal surfaces.
   1. One-Part Nonsag Silicone Sealant: Grade NS, Class 25 minimum; Uses NT, A, G, M, O; neutral curing, non-staining, fugus-resistant, non-bleeding.
   2. Multi-Part Nonsag Urethane Sealant: Grade NS, Class 25; Type M; Uses NT, M, A, and as applicable to joint substrates indicated, O.

C. Exterior and interior joints in horizontal traffic surfaces.
   1. Multi-Part Pourable Urethane Sealant: Grade P, Class 25; Type M; Uses T, M, G, A, and as applicable to joint substrates indicated, O.

D. Interior joints in vertical surfaces and horizontal nontraffic surfaces:
1. One-Part Mildew-Resistant Silicone Sealant: Grade NS, Class 25; Type S; Uses NT, G, A, and as applicable to nonporous joint substrates indicated, O; formulated with fungicide; intended for sealing interior joints with nonporous substrates and subject to in-service exposure to conditions of high humidity and temperature extremes.

E. Available Products: Subject to compliance with requirements, elastomeric sealants which may be incorporated in the Work included, but are not limited to, the following:

1. One-Part Nonsag Silicone Sealant:

2. One-Part Mildew-Resistant Silicone Sealant:
   a. "Dow-Corning 786," Dow Corning Corp.
   c. "Tremsil 200," Tremco Corp.

3. Multi-Part Nonsag Urethane Sealant for Use NT:
   b. "Dynatrol II"; Pecora Corp.
   c. "MasterSeal NP 2," BASF Corp.
   d. "Dymeric," Tremco Inc.

4. Multi-Part, Pourable, Urethane Sealant for Use T:
   c. "MasterSeal SL 2," BASF Corp.
   d. "THC-900," Tremco Inc.

2.03 LATEX JOINT SEALANTS

A. Interior joints in gypsum wall board and woodwork.

B. General: Provide manufacturer's standard one-part, nonsag, mildew-resistant, paintable latex sealant of formulation indicated that is recommended for exposed applications on interior and protected exterior locations and that accommodates indicated percentage change in joint width existing at time of installation without failing either adhesively or cohesively.

C. Siliconized Acrylic Sealant: Provide product complying with ASTM C 834, Type OP, that accommodates joint movement of not less than 5 percent in both extension and compression for a total of at least 10 percent.

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

1. Siliconized Acrylic Sealant:

2.04 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.

2. Product has flame spread and smoke developed ratings of less than 25 per ASTM E 84.

B. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

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

1. Acoustical Sealant:
2. Acoustical Sealant for Concealed Joints:

2.05 JOINT SEALANT BACKING
   A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
   B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
      1. Open-cell polyurethane foam.
      2. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
      3. Any material indicated above.
   C. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.06 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 in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
   C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION
3.01 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. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.02 PREPARATION
   A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
      1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
      2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
      3. Remove laitance and form release agents from concrete.
      4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer’s recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of 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 seal.

3.03 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer’s printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
   1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
      a. Do not leave gaps between ends of joint fillers.
      b. Do not stretch, twist, puncture, or tear joint fillers.
      c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
   2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

E. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

F. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
   1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.04 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION

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

END OF SECTION
SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Rated and non-fire-rated steel doors and frames.
   B. Thermally insulated hollow metal doors with frames.
   C. Accessories, including glazing and louvers.

1.02 RELATED REQUIREMENTS
   A. Section 08 14 16 - Flush Wood Doors.
   B. Section 08 38 15 - Double-Acting Traffic Doors.
   C. Section 08 39 53 - Blast Resistant Steel Door and Frame Assemblies.
   D. Section 08 71 00 - Door Hardware.
   E. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
   F. Section 09 90 00 - Painting.

1.03 ABBREVIATIONS AND ACRONYMMS
   B. ASCE - American Society of Civil Engineers.
   C. HMMA - Hollow Metal Manufacturers Association.
   D. NAAMM - National Association of Architectural Metal Manufacturers.
   F. SDI - Steel Door Institute.
   G. UL - Underwriters Laboratories.

1.04 REFERENCE STANDARDS
   C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
   E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
   H. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
   J. ITS (DIR) - Directory of Listed Products; current edition.
   L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
P. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.05 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
C. Shop Drawings: Details of each opening, showing elevations, frame profiles, and identifying location of different finishes, if any.
D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Hollow Metal Doors and Frames:

2.02 DESIGN CRITERIA
A. Requirements for Hollow Metal Doors and Frames:
   1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Hinged edge square, and lock edge beveled.
   5. Typical Door Face Sheets: Flush.
   7. Door Core: Polyurethane, except where mineral fiberboard core required for fire rating.
   9. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
10. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
   a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 STEEL DOORS
A. Exterior Doors: Thermally insulated.
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless (16 gage).
      a. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Thermal Resistance: R-Value of 9.9, minimum, for installed thickness of polyisocyanurate.
   3. Door Finish: Factory primed and field finished.

B. Interior Doors, Non-Fire Rated:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless (16 gage).
   2. Core Material: Polyurethane.
   3. Door Finish: Factory primed and field finished.

C. Fire-Rated Doors:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless (16 gage).
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
      a. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
      b. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      c. Attach fire rating label to each fire rated unit.
   3. Core Material: Manufacturers standard core material/construction in compliance with requirements.

2.04 HOLLOW METAL FRAMES
A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
   2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
   3. Weatherstripping: Integral, recessed into frame edge.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

E. Door Frames, Fire-Rated: Full profile/continuously welded type.
   1. Fire Rating: Same as door, labeled.
   2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
F. Mullions for Pairs of Doors: Removable type, with profile similar to jambs.
G. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
H. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.
I. Frames Wider than 48 Inch: Reinforce with steel channel fitted tightly into frame head, flush with top.
J. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.

2.05 ACCESSORIES
A. Glazing: As specified in Section 08 80 00, factory installed.
B. Removable Stops: Formed sheet steel, mitered or butted corners; prepared for countersink style tamper proof screws.
C. Astragals for Double Doors: Specified in Section 08 71 00.
D. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.
   1. Manufacturers: Equivalent to the following:
E. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
F. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center Mullions.
G. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.06 FINISHES
A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION
A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION
A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
B. Install fire rated units in accordance with NFPA 80.
C. Coordinate frame anchor placement with wall construction.
D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
E. Coordinate installation of hardware.
F. Coordinate installation of glazing.
G. Coordinate installation of electrical connections to electrical hardware items.
H. Touch up damaged factory finishes.

3.04 TOLERANCES
   A. Clearances Between Door and Frame: Comply with related requirements of specified door and frame standards or custom guidelines indicated.
   B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING
   A. Adjust for smooth and balanced door movement.
   B. Adjust doors with automatic door bottom sweeps so that seals are fully engaged when door is closed.

3.06 SCHEDULE
   A. Refer to Door and Frame Schedules on the drawings.

END OF SECTION
SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Flush wood doors; fire-rated and non-rated; plastic laminate faced.

1.02 RELATED REQUIREMENTS
A. Section 08 11 13 - Hollow Metal Doors and Frames.
B. Section 08 71 00 - Door Hardware.

1.03 REFERENCE STANDARDS
B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
C. ITS (DIR) - Directory of Listed Products; current edition.
D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
F. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide the information required by AWI/AWMAC/WI (AWS).
   2. Include certification program label.
D. Specimen warranty.
E. Samples: Submit two samples of door veneer illustrating plastic laminate pattern and color.
F. Manufacturer's Installation Instructions: Indicate special installation instructions.
G. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
B. Quality Certification: Provide AWI (QCP) inspection report and quality certification of completed work.
   1. Provide labels or certificates indicating that the work complies with requirements of AWI/AWMAC/WI (AWS) grade or grades specified.
C. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire-rating as indicated.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Package, deliver and store doors in accordance with specified quality standard.
B. Accept doors on site in manufacturer's packaging. Inspect for damage.
C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.
1.07 PROJECT CONDITIONS
   A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.08 WARRANTY
   A. Interior Doors: Provide manufacturer's warranty for the life of the installation.
   B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
   C. Manufacturer shall bear the cost of installing replacement doors. Replacement doors shall be factory finished.

PART 2 PRODUCTS

2.01 WOOD-BASED COMPONENTS
   A. Provide composite wood and agrifiber products having no added urea-formaldehyde resins.

2.02 MANUFACTURERS
   A. High Pressure Decorative Laminate (HPDL) Faced Doors:

2.03 DOORS AND PANELS
   A. Doors: Refer to drawings for locations and additional requirements.
      1. High Pressure Decorative Laminate (HPDL) Faced Doors: 5-ply unless otherwise indicated.
   B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
      1. Provide solid core doors at each location.
      2. Fire-Rated Doors: Tested to 20 minutes, 60 minutes, 90 minutes, and ratings as indicated on drawings in accordance with UL 10C - Positive Pressure; UL (DIR) or ITS (DIR) labeled without any visible seals when door is open.
      3. High pressure decorative laminate (HPDL) finish as indicated on drawings.

2.04 DOOR AND PANEL CORES
   A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
   B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.05 DOOR FACINGS
   A. High Pressure Decorative Laminate (HPDL) Facing for Fire Doors: NEMA LD 3, HGF; color(s) as indicated; matte finish.
   B. High Pressure Decorative Laminate (HPDL) Facing for Non-Fire-Rated Doors: NEMA LD 3, HGS; color(s) as indicated; matte finish.
   C. Cross Banding Behind High Pressure Laminate Finish: 1 ply; of mat-formed one-piece industry standard crossband material.
   D. Facing Adhesive: Type I - waterproof.

2.06 DOOR CONSTRUCTION
   A. Fabricate doors in accordance with door quality standard specified.
   B. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
      1. Provide solid blocking for other throughbolted hardware.
C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.
D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
F. Provide edge clearances in accordance with the quality standard specified.

2.07 ACCESSORIES
A. Hollow Metal Door Frames: As specified in Section 08 11 13.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION
A. Install doors in accordance with manufacturer’s instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
C. Use machine tools to cut or drill for hardware.
D. Coordinate installation of doors with installation of frames and hardware.
E. Install door louvers plumb and level.

3.03 TOLERANCES
A. Conform to specified quality standard for fit and clearance tolerances.
B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING
A. Adjust doors for smooth and balanced door movement.
B. Adjust closers for full closure.

3.05 SCHEDULE
A. Refer to Door and Frame Schedules on the drawings.

END OF SECTION
SECTION 08 31 13
ACCESS DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Access doors and frames for walls and ceilings.

1.02 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: For each type of product.
   1. Include construction details materials, individual components and profiles, and finishes.
C. Shop Drawings:
   1. Include plans, elevations, sections, details, and attachments to other work.
   2. Detail fabrication and installation of access doors and frames for each type of substrate.
D. Samples: For each door face material, at least 3 by 5 inches (75 by 125 mm) in size, in specified finish.
E. Product Schedule: Provide complete access door and frame schedule, including types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS
A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics according to the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
   1. NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.
   2. NFPA 288 for fire-rated access door assemblies installed horizontally.

2.02 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Jensen Industries; Div. of Broan-Nutone, LLC.
   5. Milcor Inc.
   6. Nystrom, Inc.
B. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
   1. Locations: Where required in walls and ceilings.
   2. Door: Flush panel with a core of a mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 0.036 inch (0.9 mm).
   3. Frame: Minimum 0.060-inch- (1.5-mm-) thick sheet metal with 1-inch- (25-mm-) wide, surface-mounted trim.
   5. Latch (At secure locations or in rooms not accessible to public or students): Self-latching bolt operated by flush screwdriver.
   6. Lock (At locations accessible to the public): Manufacturer’s standard key lock.

2.03 MATERIALS
A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
B. Rolled-Steel Floor Plate:  ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
C. Frame Anchors:  Same type as door face.
D. Inserts, Bolts, and Anchor Fasteners:  Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.04 FABRICATION
A. General:  Provide access door and frame assemblies manufactured as integral units ready for installation.
B. Metal Surfaces:  For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes.  Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
C. Doors and Frames:  Grind exposed welds smooth and flush with adjacent surfaces.  Furnish attachment devices and fasteners of type required to secure access doors to types of supports indicated.
  1. For concealed flanges with drywall bead, provide edge trim for gypsum board and gypsum base securely attached to perimeter of frames.
  2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded metal lath and exposed casing bead welded to perimeter of frames.
  3. Provide mounting holes in frames for attachment of units to metal or wood framing.
  4. Provide mounting holes in frame for attachment of masonry anchors.
D. Latching Mechanisms:  Furnish number required to hold doors in flush, smooth plane when closed.
  1. For cylinder locks, furnish two keys per lock and key all locks alike.

2.05 FINISHES
A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C. Appearance of Finished Work:  Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
D. Steel and Metallic-Coated-Steel Finishes:
  1. Factory Prime:  Apply manufacturer's standard, fast-curing, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 EXECUTION
3.01 EXAMINATION
A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION
A. Comply with manufacturer's written instructions for installing access doors and frames.
B. Install doors flush with adjacent finish surfaces or recessed to receive finish material.
C. Hard Ceilings:  Gypsum board finish type, 18 x 18 inch (600 x 600 mm) size, screwdriver slot lock, primed and one coat baked enamel "White".
D. Washroom Walls Above Urinal Valves:  Ceramic tile finish type, 12 x 12 inch (300 x 300 mm) size, cylinder lock, primed and two coat baked enamel to match ceramic tile color.
E. Other access doors mounted in wall for human access, 24" wide x 36" high.
3.03 ADJUSTING

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

END OF SECTION
SECTION 08 33 23
OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Overhead coiling doors, operating hardware, non-fire-rated, electric operation.
B. Wiring from electric circuit disconnect to operator to control station.

1.02 RELATED REQUIREMENTS
A. Section 05 40 00 - Cold-Formed Metal Framing.
B. Section 05 50 00 - Metal Fabrications: Steel frame at perimeter of openings.
C. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.
D. Division 26 - Electrical.

1.03 REFERENCE STANDARDS
C. ITS (DIR) - Directory of Listed Products; current edition.
D. NEMA MG 1 - Motors and Generators; 2014.
E. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
F. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide general construction, electrical equipment, and component connections and details.
C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
D. Samples: Submit two slats illustrating shape, color and finish texture.
E. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
F. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

1.05 QUALITY ASSURANCE
A. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Overhead Coiling Doors:

2.02 COILING DOORS
A. Non-Fire-Rated Interior Coiling Doors: Steel slat curtain.
   1. Product/Manufacturer: Model 620 Series Stormtite Rolling Service Door, manufactured by Overhead Door Corp; or approved equivalent.
2. Capable of withstanding positive and negative wind loads of 20 psf, without undue deflection or damage to components.
3. Nominal Slat Size: 2-5/8 inches wide x required length, flat face.
4. Finish: Galvanized, with powder coating finish.
5. Guides: Angles; galvanized steel.
6. Hood Enclosure: Manufacturer's standard; galvanized steel.
7. Electric operation.
9. Locking: Interior slide bolt lock for electric operation with interlock switch (to prevent electric operator from working when slide bolt is engaged).

2.03 MATERIALS
A. Curtain Construction: Interlocking slats.
   1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
   2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
B. Steel Slats: Minimum thickness, 24 gage; ASTM A653/A653M galvanized steel sheet.
C. Guide Construction: Continuous, of profile to retain door in place, mounting brackets of same metal.
D. Steel Guides: ASTM A36/A36M steel angles, size as required for wind loading, hot-dip galvanized per ASTM A 123/A 123M.
E. Hood Enclosure: Internally reinforced to maintain rigidity and shape.
   1. Minimum thickness; 24 gage.
   2. Galvanized steel.
F. Lock Hardware:
   1. Latching Mechanism: Inside mounted, adjustable keeper, spring activated latch bar feature to keep in locked or retracted position.
G. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

2.04 ELECTRIC OPERATION
A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
   1. Provide interlock switches on motor operated units.
B. Electric Operators:
   1. Basis of Design: Equivalent to the following, as manufactured by Overhead Door Corp.
      a. Non-Fire-Rated Doors: Model RHX, heavy duty motor with industrial worm gear in oil bath design.
   3. Motor Enclosure:
      a. Interior Doors: NEMA MG 1, Type 1; TEFC.
   4. Motor Rating: As recommended by manufacturer; continuous duty.
   5. Opening Speed: 12 inches per second.
   7. Provide electric operators with ADA-compliant audible alarm and visual indicator lights.
C. Remote-Control Station: Provide momentary-contact, key switch with key position indicators for open, close and stop.
   1. Provide interior units, full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.
   2. Overhead door needs to be operable from either inside or outside of door.
D. Radio Control: Provide radio control system consisting of the following:
   1. 3-channel universal coaxial receiver to open, close, and stop door, 1 per operator.
   2. Multifunction remote control.
   3. Remote antenna mounting kit.

E. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to stop operator upon striking object, hollow neoprene covered.

F. Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION
   A. Install units in accordance with manufacturer's instructions.
   B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
   C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
   D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
   E. Coordinate installation of electrical service with Division 26 requirements.
   F. Complete wiring from disconnect to unit components.

3.03 TOLERANCES
   A. Maintain dimensional tolerances and alignment with adjacent work.
   B. Maximum Variation From Plumb: 1/16 inch.
   C. Maximum Variation From Level: 1/16 inch.
   D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING
   A. Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.
   B. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING
   A. Clean installed components.
   B. Remove labels and visible markings.

3.06 DEMONSTRATION
   A. Startup Services: Engage a factory-authorized service representative to perform startup services and to train EXCHANGE’S maintenance personnel as specified below:
      1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
      2. Train EXCHANGE'S maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance, and procedures for testing and resetting release devices.
      3. Review data in the maintenance manuals. Refer to Section 01 77 00 - Project Closeout.
      4. Schedule training with EXCHANGE with at least 7 days’ advance notice.

END OF SECTION
SECTION 08 33 26
OVERHEAD COILING GRILLES

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Electrically operated overhead coiling grilles.

1.02 RELATED REQUIREMENTS
A. Division 26 - Electrical service and connections for powered operators, and accessories.
B. Division 26 - Disconnect switches and circuit breakers for powered operators.

1.03 DEFINITIONS
A. Operation Cycle: One complete cycle of a grille begins with the grille in the closed position. The grille is then moved to the open position and back to the closed position.

1.04 PERFORMANCE REQUIREMENTS
A. Operation-Cycle Requirements: Design overhead coiling grille components and operator to operate for not less than 20,000 cycles.
B. Seismic Performance: Overhead coiling grilles shall withstand the effects of earthquake motions determined according to SEI/ASCE 7.
   1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
   2. Seismic Component Importance Factor: 1.0.

1.05 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: For each type and size of overhead coiling grille and accessory. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes. Provide roughing-in diagrams, operating instructions, and maintenance information. Include the following:
   1. Setting drawings, templates, and installation instructions for built-in or embedded anchor devices.
   2. Summary of forces and loads on walls and jambs.
   3. Motors: Show nameplate data and ratings; characteristics; mounting arrangements; size and location of winding termination lugs, conduit entry, and grounding lug; and coatings.
C. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's data sheets.
   1. Wiring Diagrams: Detail wiring for power, signal, and control systems. Differentiate between manufacturer-installed and field-installed wiring and between components provided by grille manufacturer and those provided by others.
D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

1.06 QUALITY ASSURANCE
A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the overhead coiling grille manufacturer for both installation and maintenance of units required for this Project.
B. Source Limitations: Obtain overhead coiling grilles through one source from a single manufacturer.
   1. Obtain operators and controls from the overhead coiling grille manufacturer.
C. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled.
   1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.
PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:
   1. Alpine Overhead Doors, Inc.
   2. Atlas Door Corp.; Div. of Clopay Building Products Co.
   3. The Cookson Company.
   6. Mahon Door Corp.
   7. McKeon Rolling Steel Door Company, Inc.
   8. Metro Door.
   10. Pacific Rolling Door Co.
   12. Wayne-Dalton Corp.
   13. Windsor Door; A United Dominion Company.

2.02 OVERHEAD COILING GRILLE CURTAIN MATERIALS AND CONSTRUCTION

A. General: Fabricate overhead coiling grille curtain consisting of a network of 5/16-inch- (8-mm-) minimum diameter horizontal rods, or rods covered with tube spacers, spaced as indicated. Interconnect rods by vertical links approximately 5/8 inch (16 mm) wide, spaced as indicated and rotating on rods.
   1. Space rods at approximately 2 inches (51 mm) o.c.
   2. Space links in line at approximately 9 inches (228 mm) apart.
   3. Aluminum Grilles: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

B. Endlocks: Continuous end links, chains, or other devices at ends of rods, locking and retaining grille curtain in guides against excessive pressures, maintaining curtain alignment, and preventing lateral movement.

C. Bottom Bar: Manufacturer's standard continuous channel, tubular shape, or 2 angles, finished to match grille.
   1. Astragal: Provide a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene, between angles or fitted to shape, as a cushion bumper for interior grille.
   2. Provide motor-operated grilles with combination bottom astragal and sensor edge.

D. Curtain Jamb Guides: Manufacturer's standard extruded-aluminum shape having curtain groove with return lips or bars to retain curtain. Provide continuous integral wear strips to prevent metal-to-metal contact and minimize noise of travel. Provide removable stops on guides to prevent overttravel of curtain.

2.03 HOODS AND ACCESSORIES

A. Push/Pull Handles: For push-up-operated or emergency-operated grilles, provide lifting handles on each side of grille.

B. Fabricate locking device assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.
   1. Locking Bars: Single-jamb side, operable from inside and outside.
   2. Provide electric interlock to prevent operation when locks are engaged in tracks.

C. Where grille unit is power operated, provide safety interlock switch to disengage power supply when grille is locked.
2.04 COUNTERBALANCING MECHANISM

A. General: Counterbalance grille by means of adjustable-tension steel helical torsion spring, mounted around a steel shaft and contained in a spring barrel connected to the curtain. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate spring barrel of hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of curtain and to limit barrel deflection to not more than 0.03 in./ft. (2.5 mm/m) of span under full load.

C. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Provide cast-steel barrel plugs to secure ends of springs to barrel and shaft.

D. Fabricate torsion rod for counterbalance shaft of case-hardened steel, sized to hold fixed spring ends and carry torsional load.

E. Brackets: Provide mounting brackets of manufacturer's standard design, either cast-iron or cold-rolled steel plate.

2.05 FINISHES, GENERAL

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.06 ALUMINUM FINISHES

A. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

2.07 ELECTRIC GRILLE OPERATORS

A. General: Provide electric grille operator assembly of size and capacity recommended and provided by grille manufacturer for grille and operational life specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, remote-control stations, control devices, integral gearing for locking grille, and accessories required for proper operation.

B. Comply with NFPA 70.

C. Disconnect Device: Provide hand-operated disconnect or mechanism for automatically engaging sprocket-chain operator and releasing brake for emergency manual operation while disconnecting motor, without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

D. Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency auxiliary operator.

E. Provide control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V, ac or dc.

F. Grille-Operator Type: Provide wall-, hood-, or bracket-mounted, jackshaft, gear-head hoist-type grille operator unit consisting of electric motor, enclosed worm-gear running-in-oil primary drive, chain and sprocket secondary drive, and auxiliary chain hoist and floor level disconnect.
G. Electric Motors: Provide high-starting torque, reversible, continuous-duty, Class A insulated, electric motors, complying with NEMA MG 1, with overload protection, sized to start, accelerate, and operate grille in either direction, from any position, at not less than 2/3 fps (0.2 m/s) and not more than 1 fps (0.3 m/s), without exceeding nameplate ratings or considering service factor.
   1. Type: Polyphase, medium-induction type.
   2. Service Factor: According to NEMA MG 1, unless otherwise indicated.
   3. Coordinate wiring requirements and electric characteristics of motors with building electrical system.
   4. Provide open dripproof-type motor, and controller with NEMA ICS 6, Type 1 enclosure.
   5. Provide 208V three phase motor.

H. Remote-Control Station: Provide momentary-contact, key switch with key position indicators for open, close and stop.
   1. Provide interior and exterior units, recessed, heavy-duty type. Grill needs to be operable from either inside or outside the store.

I. Obstruction Detection Device: Provide each motorized grille with indicated external automatic safety sensor able to protect full width of grille opening. Activation of sensor immediately stops and reverses downward grille travel.
   1. Sensor Edge: Provide each motorized grille with an automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor immediately stops and reverses downward grille travel. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable.
   2. Provide electrically actuated automatic bottom bar.
   3. Self-Monitoring Type: Provide self-monitoring, 4-wire configured device.

J. Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop grille at fully opened and fully closed positions.

K. Emergency Egress Release: Provide grille with flush, wall-mounted handle mechanism, for ADA-compliant egress feature, not dependent on electric power, which allows grille to open to permit passage and automatically resets motor drive, without affecting limit switches, with return of handle to original position.

PART 3 - EXECUTION

3.01 INSTALLATION
   A. General: Install grilles and operating equipment complete with necessary hardware, according to Shop Drawings, manufacturer's written instructions, and as specified.

3.02 ADJUSTING
   A. Lubricate bearings and sliding parts; adjust grilles to operate easily, free from warp, twist, or distortion and fitting tight for entire perimeter.

3.03 EXCESS MATERIALS AND WASTE
   A. Recycling: Separate and recycle all waste materials in accordance with the Contractor's waste management plan and to the extent economically feasible. This includes metal banding, pallets, and other shipping materials in addition to waste resulting from installation operations.

3.04 DEMONSTRATION
   A. Startup Services: Engage a factory-authorized service representative to perform startup services and to train EXCHANGE'S maintenance personnel as specified below.
      1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
      2. Train EXCHANGE'S maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance, and procedures for testing and resetting release devices.
      3. Review data in the maintenance manuals. Refer to Division 1 Section "Project Closeout."
4. Schedule training with EXCHANGE with at least 7 days’ advance notice.

END OF SECTION
SECTION 08 38 15
DOUBLE-ACTING TRAFFIC DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Double-acting, self-closing, swinging traffic doors.
B. Double-acting, self-closing, swinging gate/cafe doors.
C. Door accessories.

1.02 RELATED REQUIREMENTS
A. Section 08 11 13 - Hollow Metal Doors and Frames: Cased opening frames.

1.03 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Manufacturer's technical information for each type of door specified, including details about materials, components, profiles, gaskets, and finishes; include:
   1. Preparation and installation instructions and methods.
   2. Storage and handling requirements and recommendations.
   3. Operation and maintenance data.
C. Shop Drawings: Show installation details of doors and frames, including elevations and attachment.
D. Selection Samples: For each finish requiring color selection, submit color samples indicating full line of available colors and finishes.
E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing type of work specified in this section with not less than three years of documented experience and approved by manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Deliver product in manufacturer's original unopened packages with label legible and intact.
B. Store doors at project site on edge or in upright position, under cover and elevated above grade, following manufacturer's instructions.

1.06 WARRANTY
A. Provide manufacturer's standard two-year warranty that products are free of defects in material and workmanship.

PART 2 PRODUCTS

2.01 RIGID AND SEMI-RIGID TRAFFIC DOORS
A. Wood Core Double-Acting Traffic Doors: Wood core laminated with finish faces both sides, edges sealed or trimmed.
   1. Core: 7-ply exterior grade plywood; 3/4 inches thick.
   2. Faces: High pressure laminate, 0.032 inch thick; suede or matte finish.
   3. Edge Trim: Type 304 stainless steel wrap-around 18 gage channel trim applied over finish faces.
   4. Color: As selected by Contracting Officer's Representative from manufacturer's standard selection.
   5. Hinges: Manufacturer's standard heavy duty double-action hinge assemblies.
6. Glazing: Scratch-resistant 16” x 16” clear acrylic vision panel set in black rubber window molding.

7. Impact Plates: Provide 18 gage stainless steel base plates on both sides of doors.
   a. Height: 48 inches.

8. Manufacturers:

2.02 GATE/CAFE DOORS
   A. Double-Acting, Self-Closing, Swinging Gate/Cafe Doors: Equivalent to the following:
      1. Panel Construction: 1/4-inch thick ABS plastic, textured on front side, smooth on back side. Back edge spine shall be 3/4-inch thick ABS with a stainless steel channel.
      2. Hinge System: Full length back spine shall contain an in-line cam, coil spring gravity assist hinge system to help the door close fast.
      3. Color: As selected by Contracting Officer's Representative from manufacturer's standard colors.
      4. Manufacturers:

2.03 ACCESSORY COMPONENTS
   A. Swing Limiting Posts: Manufacturer's standard construction; color as selected by Contracting Officer's Representative from manufacturer's standard selection; provide wherever potential door swing exceeds maximum swing for which hinges are designed unless door stop is specified elsewhere.
   B. Provide tamper proof fasteners and other hardware as recommended by manufacturer for complete installation.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that jambs and frames are square and plumb.
   B. Verify that opening is ready to receive work and opening dimensions and clearances are as indicated on drawings.
   C. If substrate preparation is responsibility of another installer, notify Contracting Officer's Representative of unsatisfactory conditions before proceeding.
   D. Commencement of work by installer is acceptance of opening conditions.

3.02 PREPARATION
   A. Clean surfaces thoroughly prior to installation.
   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best results for the substrate under the project conditions.

3.03 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install doors with clearances, anchors, hardware, and accessories according to the manufacturer's instructions and as specified.
   C. Reinforce hollow metal jambs at hardware locations.
   D. Install doors plumb, level, and properly aligned.

3.04 ADJUSTING
   A. Clean and lubricate operating parts.
   B. Adjust doors to open and close smoothly and freely without binding and for proper fit of seals.
3.05 CLEANING
   A. Clean surfaces using methods as recommended by manufacturer.

3.06 PROTECTION
   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 08 39 53
BLAST RESISTANT STEEL DOOR AND FRAME ASSEMBLIES

GENERAL

1.01 SECTION INCLUDES
A. Blast-resistant non-rated pressed steel frames.
B. Blast resistant non-rated steel swing doors.
C. Factory-supplied and installed hinges, mortise locksets, mortise exit devices, and vertical rod exit devices.
D. Factory-supplied thresholds and weatherstripping.

1.02 RELATED SECTIONS
A. Section 07 92 00 - Joint Sealants: Caulking between doors and adjacent construction.
B. Section 08 71 10 - Door Hardware: Hardware for blast doors to supplement hardware specified in this section.
C. Section 09 90 00 - Painting: Field painting of doors and frames.

1.03 REFERENCES
B. ASTM A653/A653M-06 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
D. UFC 3-340-02 - Structures to Resist the Effects of Accidental Explosions.
F. PIP STC01018 – Blast Resistant Building Design Criteria.
H. ASTM F2247 – Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method).
J. HMMA 802-92 - Manufacturing of Hollow Metal Doors and Frames.
K. HMMA 840-99 - Installation and Storage of Hollow Metal Doors and Frames.
L. UL10C-98 Standards for Positive Pressure Fire Tests of Door Assemblies.

1.04 PERFORMANCE REQUIREMENTS
A. Per UFC 4-010-1 Category 2, medium with standoff distances shown on the site plan.

1.05 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide product data on door construction and frame.
C. Shop Drawings: Indicate door and frame elevations, internal reinforcement, anchor types, closure methods, location of cut-outs for hardware, and cut-outs for glazing.
D. Samples: Submit manufacturer's door finish samples, as well as manufacturer’s frame corner sample.
E. Test Data:
   1. Submit independent test data from a recognized licensed laboratory indicating compliance with the blast-resistance requirements.
2. When blast resistance is not supported by prototype tests, design calculations by a licensed professional engineer shall be accepted.

1.06 QUALITY ASSURANCE
A. Perform Work to requirements of HMMA (Hollow Metal Manufacturers Association) standards.
B. Manufacturer: Minimum 5 years documented experience manufacturing blast resistant door and frame assemblies.
C. Pre-Installation Meeting: Convene a pre-installation meeting 2 weeks before start of installation of door and frame assemblies. Require attendance of parties directly affecting work of this section, including contractor, architect, installer, and manufacturer's representative. Review installation and coordination with other work.

1.07 DELIVERY, STORAGE AND PROTECTION
A. Comply with HMMA 840.
B. Weld minimum two temporary jamb spreaders per frame prior to shipment.
C. Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.
D. Store in vertical position, spaced with blocking to permit air circulation between components.
E. Store materials out of water and covered to protect from damage.
F. Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

1.08 WARRANTY
A. Manufacturer's Limited Warranty: Five (5) years from date of supply, covering material and workmanship.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
A. Basis of Design: AMBICO Limited.
B. Substitutions: Refer to Section 00 04 04.

2.02 MATERIALS
A. Sheet Steel: Galvanized steel to ASTM A653/A653M.
   1. Coating designation (G90) for exterior door assemblies.
B. Reinforcement: To CSA G40.20/G40.21, coating designation to ASTM A653/A653M.
C. Structural Plate: Hot rolled steel to ASTM A1011.

2.03 ACCESSORIES
A. Hinges: Heavy-weight butt-type stainless steel hinges shall be factory-supplied and pre-installed.
B. Exit Devices: Heavy-duty vertical-rod exit devices shall be factory-supplied and pre-installed.
C. Thresholds and perimeter seals shall be factory-supplied.
D. Reminder of Door Hardware: As specified in Section 08 71 00.
E. Primer: Rust inhibitive zinc chromate.

2.04 FABRICATION
A. Manufacture doors and in accordance with performance requirements in Section 1.4 and HMMA 802-92 - Manufacturing of Hollow Metal Doors and Frames.
B. Steel Doors, Swing Type:
   1. Sheet steel faces, thickness, design, and core suitable to achieve specified blast performance.
2. Blast resistant construction, longitudinal edges welded, filled and sanded with no visible edge seams.
3. Top and Bottom Channels: Inverted, recessed, welded steel channels.
4. Astragals: Metal astragals for double doors designed to conform with blast pressure rating.
5. Weld structural steel channels flush to top and bottom of door.
6. Weld hardware reinforcement plates in place.

C. Steel Frames, Swing Type:
   1. Sheet steel and metal thickness appropriate to maintain door blast and fire ratings, mitred corners.
   2. Factory assemble and weld frames.
   3. Provide three single silencers for single doors on strike side, and two single silencers on frame head at double doors without mullions.
   4. Hinges and latching devices to be factory supplied and pre-installed.
   5. Affix permanent metal nameplates to door and frame, indicating manufacturer's name, door tag, model number, and performance rating.

2.05 PRE-INSTALLATION OF SWINGING DOOR HARDWARE
   A. Hinges and latching device shall be supplied complete with door and frame in conformance with blast resistant requirements of project.
   B. Hinges and latching device shall be factory pre-installed on the door and frame assembly.

2.06 FINISHES
   A. Factory Finish: Factory applied zinc chromate primer to be applied to all exposed surfaces touch-up only, where product has been welded and ground smooth.

PART 3 - EXECUTION
3.01 INSTALLATION
   A. Install components including doors, frames, and hardware in accordance with manufacturer's written instructions.
   B. Install doors and frames to HMMA 840 standards and in accordance with NFPA 80, and local authority having jurisdiction.
   C. Coordinate with masonry, gypsum board, concrete wall construction for anchor placement.
   D. Set frames plumb, square, level and at correct elevation.
   E. Allow for deflection to ensure that structural loads are not transmitted to frame.
   F. Adjust operable parts for correct clearances and function.
   G. Finish paint in accordance with Section 09 90 00.

3.02 ERECTION TOLERANCES
   A. Installation tolerances of installed frame for squareness, alignment, twist and plumbness are to be no more than ±1/16in (1.5mm) in compliance with HMMA 841.

3.03 FIELD QUALITY CONTROL
   A. Provide qualified manufacturer's representative to instruct installers on the proper installation and adjustment of door assemblies.
   B. Provide manufacturer's representative to inspect door installation, and test minimum ten (10) cycles of operation. Correct any deficient doors.

3.04 SCHEDULE
   A. Blast Resistant Steel Door and Frame Assembly Schedule:
      1. Door 112a (Single door, with hinges, mortise lockset, threshold and weatherstripping. All other hardware specified in Section 08 71 00.)
      2. Door 113 (Single door, with hinges, mortise exit device, threshold and weatherstripping. All other hardware specified in Section 08 71 00.)
3. Door 119a (Pair of doors, with hinges, vertical rod exit device on each door, threshold and weatherstripping. All other hardware specified in Section 08 71 00.)

END OF SECTION
SECTION 08 41 13
ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Exterior and interior storefront systems.

1.02 RELATED REQUIREMENTS
A. Section 07 92 00 - Joint Sealants: Joint sealants installed as part of aluminum entrance and storefront systems.
B. Section 08 41 13.53 - Aluminum Storefronts (Blast Resistant).
C. Section 08 42 29.53 - Sliding Automatic Entrances (Blast Resistant).
D. Section 08 71 00 - Door Hardware.
E. Section 08 80 00 - Glazing: Glass and glazing.

1.03 SYSTEM DESCRIPTION
A. General: Provide aluminum entrance and storefront systems capable of withstanding loads and thermal and structural movement requirements indicated without failure, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project. Failure includes the following:
   1. Air infiltration and water penetration exceeding specified limits.
   2. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units.
B. Glazing: Physically and thermally isolate glazing from framing members.
C. Thermally Broken Construction: Provide systems that isolate aluminum exposed to exterior from aluminum exposed to interior with a material of low thermal conductance.
D. Wind Loads: Provide storefront systems, including anchorage, capable of withstanding wind-load design pressures calculated according to requirements of authorities having jurisdiction or the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, "Analytical Procedure," whichever are more stringent.
   1. Deflection of framing members in a direction normal to wall plane is limited to 1/175 of clear span or 3/4 inch (19 mm), whichever is smaller, unless otherwise indicated.
   2. Static-Pressure Test Performance: Provide storefront systems that do not evidence material failures, structural distress, failure of operating components to function normally, or permanent deformation of main framing members exceeding 0.2 percent of clear span when tested according to ASTM E 330.
      a. Test Pressure: 150 percent of inward and outward wind-load design pressures.
      b. Duration: As required by design wind velocity; fastest 1 mile (1.609 km) of wind for relevant exposure category.
E. Seismic Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding the effects of earthquake motions calculated according to requirements of authorities having jurisdiction or ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 9, "Earthquake Loads," whichever are more stringent.
F. Dead Loads: Provide entrance- and storefront-system members that do not deflect an amount which will reduce glazing bite below 75 percent of design dimension when carrying full dead load.
   1. Provide a minimum 1/8-inch (3.18-mm) clearance between members and top of glazing or other fixed part immediately below.
   2. Provide a minimum 1/16-inch (1.59-mm) clearance between members and operable windows and doors.
G. Live Loads: Provide entrance and storefront systems, including anchorage, that accommodate the supporting structures' deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.
   1. Frames, mullions and window hardware must resist a static load of 7 kilopascals (1 lb. per sq. in.) applied to the surface of the glazing. Frame and mullion deformations shall not exceed 1/160 of the unsupported member lengths.
   2. Provide a minimum frame height of 25 mm (1-in). Design frame connections to surrounding walls to resist a combined ultimate loading of a tension force of 35 kN/m (200lbs-in.) and a shear force of 13 kN/m (75lbs-in.).

H. Air Infiltration: Provide entrance and storefront systems with permanent resistance to air leakage through fixed glazing and frame areas of not more than 0.06 cfm/sq. ft. (0.3 L/s/sq. m) of fixed wall area when tested according to ASTM E 283 at a static-air-pressure difference of 1.57 lbf/sq. ft. (75.2 Pa).

I. Water Penetration: Provide entrance and storefront systems that do not evidence water leakage through fixed glazing and frame areas when tested according to ASTM E 331 at minimum differential pressure of 20 percent of inward-acting wind-load design pressure as defined by ASCE 7, “Minimum Design Loads for Buildings and Other Structures,” but not less than 6.24 lbf/sq. ft. (299 Pa). Water leakage is defined as follows:
   1. Uncontrolled water infiltrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained back to the exterior and cannot damage adjacent materials or finishes is not water leakage.

J. Thermal Movements: Provide entrance and storefront systems, including anchorage, that accommodate thermal movements of systems and supporting elements resulting from the following maximum change (range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, failure of doors or other operating units to function properly, and other detrimental effects.
   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

K. Structural-Support Movement: Provide entrance and storefront systems that accommodate structural movements including, but not limited to, sway and deflection.

L. Condensation Resistance: Provide storefront systems with condensation resistance factor (CRF) of not less than 45 when tested according to AAMA 1503.1.

M. Average Thermal Conductance: Provide storefront systems with average U-values of not more than 0.63 Btu/sq. ft. x h x deg F (3.57 W/sq. m x K) when tested according to AAMA 1503.1.

N. Dimensional Tolerances: Provide entrance and storefront systems that accommodate dimensional tolerances of building frame and other adjacent construction.

1.04 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: For each product specified. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes.

C. Shop Drawings: For entrance and storefront systems. Show details of fabrication and installation, including plans, elevations, sections, details of components, provisions for expansion and contraction, and attachments to other work.
   1. For entrance systems, include hardware schedule and indicate operating hardware types, quantities, and locations.

D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

E. Sealant Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating that materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with sealants; include joint sealant manufacturers' written interpretation of test
results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.

F. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of entrance and storefront systems with requirements based on comprehensive testing of current systems.

G. Samples for Verification Purposes: 6" long, sample of frame material showing cross-section, thermal break construction and color.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing entrance and storefront systems similar to those required for this Project and who is acceptable to manufacturer.

B. Source Limitations: Obtain each type of entrance and storefront system through one source from a single manufacturer.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of entrance and storefront systems and are based on the specific systems indicated. Other manufacturers' systems with equal performance characteristics may be considered. Refer to Section 00 04 04 - Substitutions.

1. Do not modify intended aesthetic effect, as judged solely by Contracting Officer, except with Contracting Officer's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Contracting Officer for review.


1.06 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

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

1. Butler Manufacturing Company; Vistawall Architectural Products.
2. EFCO Corporation.
5. YKK AP America Inc.
6. Arcadia
7. Capitol Aluminum and Glass Corporation.
8. Old Castle Building Envelope.

2.02 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.

5. Welding Rods and Bare Electrodes: AWS A5.10.
B. Steel Reinforcement: Complying with ASTM A 36 (ASTM A 36M) for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 (ASTM A 570M) for hot-rolled sheet and strip.

C. Glazing as specified in Section 08 80 00 - Glazing.

D. Glazing Gaskets: Manufacturer's standard pressure-glazing system of black, resilient glazing gaskets, setting blocks, and shims or spacers, fabricated from an elastomer of type and in hardness recommended by system and gasket manufacturer to comply with system performance requirements. Provide gasket assemblies that have corners sealed with sealant recommended by gasket manufacturer.

E. Secondary Sealant: For use as weatherseal, compatible with structural silicone sealant and other system components with which it comes in contact, and that accommodates a 50 percent increase or decrease in joint width at the time of application when measured according to ASTM C 719.
   2. Use neutral-cure silicone sealant with insulating-glass units.

F. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.

G. Sealants and joint fillers for joints at perimeter of storefront systems as specified in Division 7 Section "Joint Sealants."

H. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.03 COMPONENTS

A. Exterior Framing: 2\" x 4-1/2\" nominal dimension, thermally broken; flush glazing stops; internal weep drainage, glazed to outside face of frame.

B. Interior Framing: 2\" x 4-1/2\" nominal dimension, flush glazing stops; glazed to outside face of frame.

C. Doors: Provide manufacturer's standard 1-3/4-inch- (44.5-mm-) thick glazed doors with minimum 0.125-inch- (3.2-mm-) thick, extruded tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie-rods.
   1. Glazing stops and Gaskets: Provide manufacturer's standard snap-on extruded-aluminum glazing stops and preformed gaskets, non-removable at exterior.
   2. Stile Design: Medium stile; 5 inch (127 mm) nominal width.
   3. Reinforce doors for automatic swing operation as specified in Door Hardware Section 08 71 00.
   4. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
   5. Exterior glass to be 1\" clear insulated tempered glass.
   6. Interior glass to be 1/4\" clear tempered glass.

D. Brackets and Reinforcements: Provide manufacturer's standard brackets and reinforcements that are compatible with adjacent materials. Provide nonstaining, nonferrous shims for aligning system components.

E. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Reinforce members as required to retain fastener threads.
   2. Do not use exposed fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.

F. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.
G. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing, compatible with adjacent materials, and of type recommended by manufacturer.

H. Weather Stripping: Manufacturer's standard replaceable weather stripping as follows:
   1. Compression Weather Stripping: Molded neoprene complying with ASTM D 2000 requirements or molded PVC complying with ASTM D 2287 requirements.
   2. Sliding Weather Stripping: Wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing complying with AAMA 701 requirements.

2.04 HARDWARE
   A. See Section 08 71 00 - Door Hardware.

2.05 FABRICATION
   A. General: Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.
   1. Fabricate components for screw-spline frame construction.
   B. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.
   C. Prepare components to receive concealed fasteners and anchor and connection devices.
   D. Fabricate components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.
   E. Welding: Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
   F. Glazing Channels: Provide minimum clearances for thickness and type of glass indicated according to FGMA's "Glazing Manual."
   G. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
   H. Storefront: Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory assemble components to greatest extent possible. Disassemble components only as necessary for shipment and installation.
   I. Entrances: Fabricate door framing in profiles indicated. Reinforce as required to support imposed loads. Factory assemble door and frame units and factory install hardware to greatest extent possible. Reinforce door and frame units as required for installing hardware indicated. Cut, drill and tap for factory-installed hardware before finishing components.
      1. Exterior Doors: Provide compression weather stripping at fixed stops. At other locations, provide sliding weather stripping retained in adjustable strip mortised into door edge.
      2. Interior Doors: Provide sliding weather stripping retained in adjustable strip mortised into door edge.
      3. Reinforce for automatic swing operators as specified in Section 08 71 00.

2.06 ALUMINUM FINISHES
   A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
   B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

D. Class I, Clear Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: Nonspecular as fabricated; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, or electrolytically deposited coating 0.018 mm or thicker) complying with AAMA 606.1 or AAMA 608.1.
   1. Color: Dark Bronze.

2.07 STEEL PRIMING

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying primer.

B. Surface Preparation: Perform manufacturer's standard cleaning operations to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel.

C. Priming: Apply manufacturer's standard corrosion-resistant primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of entrance and storefront systems. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. General: Comply with manufacturer's written instructions for protecting, handling, and installing entrance and storefront systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.

B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

D. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Section 07 92 00 - Joint Sealants.

E. Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.

F. Install entrances plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.
   1. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.

G. Install glazing to comply with requirements of Section 08 80 00 - Glazing, unless otherwise indicated.

H. Install secondary-sealant weatherseal according to sealant manufacturer's written instructions to provide weatherproof joints. Install joint fillers behind sealant as recommended by sealant manufacturer.

I. Install perimeter sealant to comply with requirements of Section 07 92 00 - Joint Sealants, unless otherwise indicated.
J. Erection Tolerances: Install storefront systems to comply with the following maximum tolerances:
   1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
   2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm). Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).
   3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

3.03 ADJUSTING AND CLEANING
   A. Adjust doors and hardware to provide tight fit at contact points and weather stripping, smooth operation and weathertight closure.
   B. Remove excess sealant and glazing compounds, and dirt from surfaces.

3.04 PROTECTION
   A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure storefront systems are without damage or deterioration at the time of Substantial Completion.

END OF SECTION
SECTION 08 41 13.53
ALUMINUM STOREFRONTS (BLAST RESISTANT)

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Exterior storefront and entrance systems for blast resistant glazing.

1.02 RELATED REQUIREMENTS
A. Section 07 92 00 - Joint Sealants: Joint sealants installed as part of aluminum entrance and storefront systems.
B. Section 08 41 13 - Aluminum Entrances and Storefronts.
C. Section 08 42 29 - Automatic Entrances.
D. Section 08 42 29.53 - Sliding Automatic Entrances (Blast Resistant).
E. Section 08 71 00 - Door Hardware.
F. Section 08 80 00 - Glazing: Glass and glazing.

1.03 SYSTEM DESCRIPTION
A. General: Provide aluminum entrance and storefront systems capable of withstanding loads and thermal and structural movement requirements indicated without failure, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project. Failure includes the following:
   1. Air infiltration and water penetration exceeding specified limits.
   2. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units.
B. Force Protection: Exterior system must comply with UFC 4-010-01, part B-3.1.2.
C. Glazing: Physically and thermally isolate glazing from framing members.
D. Dead Loads: Provide entrance- and storefront-system members that do not deflect an amount which will reduce glazing bite below 75 percent of design dimension when carrying full dead load.
   1. Provide a minimum 1/8-inch (3.18-mm) clearance between members and top of glazing or other fixed part immediately below.
   2. Provide a minimum 1/16-inch (1.59-mm) clearance between members and operable windows and doors.
E. Exterior System Live Loads: Provide entrance and storefront systems, including anchorage, that accommodate the supporting structures' deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.
   1. Storefront (IG500 Test):
      a. Design 65 psf (1.59)
      b. Structural +/- 97.5 psf (195 mph).
F. Air Infiltration: Provide entrance and storefront systems with permanent resistance to air leakage through fixed glazing and frame areas of not more than1.00 cfm/sq. ft. of fixed wall area at a static-air-pressure difference of 6.24 lbf/sq. ft. per IG 500 Test.
G. Water Penetration: Provide entrance and storefront systems that do not evidence water leakage through fixed glazing and frame areas when tested according to ASTM E 331. No water penetration at test pressure of 12 psf per IG 500 Test. Water leakage defined as follows:
   1. Uncontrolled water infiltrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained back to the exterior and cannot damage adjacent materials or finishes is not water leakage.
H. Thermal Movements: Provide entrance and storefront systems, including anchorage, that accommodate thermal movements of systems and supporting elements resulting from the following maximum change (range) in ambient and surface temperatures without buckling,
damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, failure of
doors or other operating units to function properly, and other detrimental effects.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C),
material surfaces.

I. Structural-Support Movement: Provide entrance and storefront systems that accommodate
structural movements including, but not limited to, sway and deflection.

J. Forced Entry Resistance: Shall be tested with a 300 lb. force applied to the active door panel
simultaneously with a 150 lb. force applied in both perpendicular directions to the 300 lb. force.

K. Blast Test: Shall be tested in accordance with DoD, GSA and ASTM test proceeds. Three (3)
test units 96" x 96" made up of a 3’ x 7’ door, 5’ x 6’ sidelite, 5’ x 2’ sidelite and transom passed:
1. 4.4 psi
2. 32 psi – msec impulse
3. 19 msec duration
4. DoD response – High and medium
5. GSA response – Condition 1 and 2
6. ASTM response – No hazard and minimal hazard

L. Dimensional Tolerances: Provide entrance and storefront systems that accommodate
dimensional tolerances of building frame and other adjacent construction.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: For each product specified. Include details of construction relative to materials,
dimensions of individual components, profiles, and finishes.

C. Shop Drawings: For storefront systems. Show details of fabrication and installation, including
plans, elevations, sections, details of components, provisions for expansion and contraction,
and attachments to other work.

D. Installer Certificates: Signed by manufacturer certifying that installers comply with specified
requirements.

E. Sealant Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating that
materials forming joint substrates and joint-sealant backings have been tested for compatibility
and adhesion with sealants; include joint sealant manufacturers' written interpretation of test
results relative to sealant performance and recommendations for primers and substrate
preparation needed to obtain adhesion.

F. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed
by a qualified independent testing agency, indicate compliance of entrance and storefront
systems with requirements based on comprehensive testing of current systems.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility
and perform work of this Section who has specialized in installing entrance and storefront
systems similar to those required for this Project and who is acceptable to manufacturer.

B. Source Limitations: Obtain each type of storefront system through one source from a single
manufacturer.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of storefront
systems and are based on the specific systems indicated. Other manufacturers' systems with
equal performance characteristics may be considered. Refer to Section 00 04 04 -
Substitutions.

1. Do not modify intended aesthetic effect, as judged solely by Contracting Officer, except
with Contracting Officer's approval and only to the extent needed to comply with
performance requirements. Where modifications are proposed, submit comprehensive
explanatory data to Contracting Officer for review.

2. Whenever substitute products are to be considered, supporting technical literature,
samples, drawings and performance data must be submitted ten (10) days prior to bid in
order to make a valid comparison of the products involved. Test reports certified by an
independent test laboratory must be made available upon request.

D. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding
Code--Aluminum."

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate
measurements on Shop Drawings. Coordinate fabrication schedule with construction progress
to avoid delaying the Work.

PART 2 - PRODUCTS

2.01 BASIS OF DESIGN

A. Drawings and specifications are based on the Series BR604 and BR606 systems as
manufactured by United States Aluminum. Products from the following manufacturers may be
considered if submitted in accordance with Section 00 04 04 - Submittals, and compliance with
this specification section:
1. Arcadia, Inc.
2. CMI Architectural
3. EFCO Corporation
4. Kawneer North America; an Alcoa company
5. Pittco Architectural Metals, Inc.
6. Tubelite
7. United States Aluminum
8. Vistawall Architectural Products; The Vistawall Group; a Bluescope Steel company
9. YKK AP America, Inc.

2.02 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish
indicated, complying with the requirements of standards indicated below.
2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221 T5 temper (ASTM B 221M).
5. Welding Rods and Bare Electrodes: AWS A5.10.
6. Fasteners shall be aluminum, stainless steel or zinc plated steel per ASTM A164.

B. Steel Reinforcement: Complying with ASTM A 36 (ASTM A 36M) for structural shapes, plates,
and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 (ASTM A 570M) for
hot-rolled sheet and strip.

C. Glazing as specified in Section 08 80 00 - Glazing, 1 5/16" thick insulating laminated glass units.

D. Glazing Gaskets: Manufacturer's standard pressure-glazing system of black, resilient glazing
gaskets, setting blocks, and shims or spacers, fabricated from an elastomer of type and in
hardness recommended by system and gasket manufacturer to comply with system
performance requirements. Provide gasket assemblies that have corners sealed with sealant
recommended by gasket manufacturer.

E. Secondary Sealant: For use as weatherseal, compatible with structural silicone sealant and
other system components with which it comes in contact, and that accommodates a 50 percent
increase or decrease in joint width at the time of application when measured according to ASTM
C 719.
2. Use neutral-cure silicone sealant with insulating-glass units.

F. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint
type.

G. Sealants and joint fillers for joints at perimeter of entrance and storefront systems as specified
in Division 7 Section "Joint Sealants."
H. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.03 COMPONENTS
A. Framing: 2-1/2” x 5” nominal dimension, flush glazing stops; internal weep drainage, glazed to outside face of frame.
B. Brackets and Reinforcements: Provide manufacturer’s standard brackets and reinforcements that are compatible with adjacent materials. Provide nonstaining, nonferrous shims for aligning system components.
C. Fasteners and Accessories: Manufacturer’s standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
   1. Reinforce members as required to retain fastener threads.
   2. Do not use exposed fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.
D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.
E. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing, compatible with adjacent materials, and of type recommended by manufacturer.
F. Weather Stripping: Manufacturer's standard replaceable weather stripping as follows:
   1. Compression Weather Stripping: Molded neoprene complying with ASTM D 2000 requirements or molded PVC complying with ASTM D 2287 requirements.
   2. Sliding Weather Stripping: Wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing complying with AAMA 701 requirements.

2.04 MATERIALS
A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
   2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
   4. Structural Profiles: ASTM B 308/B 308M.
   5. Welding Rods and Bare Electrodes: AWS A5.10/A5.10M.
B. Steel Reinforcement: Manufacturer’s standard zinc-rich, corrosion-resistant primer, complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.
   1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
   2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
   3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.05 FRAMING SYSTEMS
A. Framing Members: Manufacturer’s standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads.
   2. Glazing System: Retained mechanically with gaskets on four sides.
B. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts, complying with ASTM A 123/A 123M or ASTM A 153/A 153M.

E. Concealed Flashing: Dead-soft, 0.018-inch- (0.457-mm-) thick stainless steel, ASTM A 240/A 240M of type recommended by manufacturer.

F. Framing System Gaskets and Sealants: Manufacturer's standard, recommended by manufacturer for joint type.

2.06 GLAZING SYSTEMS

A. Glazing: As specified in Section 08 80 00 - Glazing.

B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, molded or extruded, of profile and hardness required to maintain watertight seal.

C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.

D. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
   1. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.

2.07 HARDWARE

A. See Section 08 71 00 - Door Hardware.

2.08 FABRICATION

A. General: Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

B. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.

C. Prepare components to receive concealed fasteners and anchor and connection devices.

D. Fabricate components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

E. Welding: Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

F. Glazing Channels: Provide minimum clearances for thickness and type of glass indicated according to FGMA's "Glazing Manual."

G. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Storefront: Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory assemble components to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.09 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

D. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: Nonspecular as fabricated; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 606.1 or AAMA 608.1.
   1. Color: Dark bronze.

PART 3 - EXECUTION

3.01 EXAMINATION

   A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of entrance and storefront systems. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

   A. General: Comply with manufacturer's written instructions for protecting, handling, and installing entrance and storefront systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.

   B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

   C. Install components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

   D. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Section 07 92 00 - Joint Sealants.

   E. Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.

   F. Install glazing to comply with requirements of Section 08 80 00 - Glazing, unless otherwise indicated.

   G. Install secondary-sealant weatherseal according to sealant manufacturer’s written instructions to provide weatherproof joints. Install joint fillers behind sealant as recommended by sealant manufacturer.

   H. Install perimeter sealant to comply with requirements of Section 07 92 00 - Joint Sealants, unless otherwise indicated.

   I. Erection Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances:
      1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
      2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm). Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).
      3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).
3.03 ADJUSTING AND CLEANING
   A. Remove excess sealant and glazing compounds, and dirt from surfaces.

3.04 PROTECTION
   A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, which ensure entrance and storefront systems are without damage or deterioration at the time of Substantial Completion.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. All-glass entrances.
B. All-glass storefronts.
C. Swinging doors.

1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Supplementary supports.
B. Section 05 50 00 - Metal Fabrications: Structural support framing.
C. Section 08 71 00 - Door Hardware: Lock cylinders.

1.03 REFERENCE STANDARDS

A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene at project site seven calendar days prior to scheduled beginning of construction activities of this section to review section requirements.
   1. Require attendance by representatives of installer and entities effected by adjacent or other work related to this section.
   2. Notify Contracting Officer’s Representative four calendar days in advance of scheduled meeting date.

1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Manufacturer's descriptive literature for each component in all-glass entrance assembly.
C. Shop Drawings: Drawings showing layout, dimensions, identification of components, and interface with adjacent construction.
   1. Include field measurements of openings.
   2. Include elevations showing:
      a. Appearance of all-glass entrance layouts.
      b. Locations and identification of manufacturer-supplied door hardware and fittings.
      c. Locations and sizes of cut-outs and drilled holes for other door hardware.
   3. Include details of:
      a. Requirements for support and bracing at openings.
      b. Installation details.
      c. Appearance of manufacturer-supplied door hardware and fittings.
   4. Schedule: Listing of each type component in all-glass entrance assemblies, cross-referenced to shop drawing plans, elevations, and details.
D. Selection Samples: Two sets, representing manufacturer's full range of available metal materials and finishes.
E. Verification Samples: Two samples, minimum size 2 by 3 inches, representing actual material and finish of exposed metal.
F. Certificates: Contractor's certification that installer of entrance assemblies meets specified qualifications.
G. Operation and Maintenance Data: For manufacturer-supplied operating hardware.

1.06 QUALITY ASSURANCE
A. Installer Qualifications: Minimum three years of experience installing entrance assemblies similar to those specified in this section.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until installation.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. All-Glass Entrances and Storefronts:

2.02 ALL-GLASS ENTRANCES AND STOREFRONTS ASSEMBLIES
A. Entrances and Storefronts: Factory fabricated assemblies consisting of frameless glass panels fastened with metal structural fittings in configuration indicated on the drawings.
   1. Operational Loads: Designed to withstand door operation under normal traffic without damage, racking, sagging, or deflection.
   2. Prepared for all specified hardware whether specified in this section or not.
   3. Finished metal surfaces protected with strippable film.
   4. Factory assembled to greatest extent practicable; may be disassembled to accommodate shipping constraints.

B. Swinging Door Fittings and Hardware:
   1. Top and bottom pivots concealed in full width rails top and bottom.
   2. Floor Closer.
   4. Deadbolt mounted in bottom rail.
   5. Single Doors: Floor mounted door stop.

2.03 BASIS OF DESIGN - FITTINGS AND HARDWARE
A. Rail Style Fittings for Swinging Doors and Related Fixed Glazing:
   1. Basis of Design: DORMA USA, Inc; DRS Rail System.
      a. Full Length Top Rails: 4 inch high, square edge.
      b. Full Length Bottom Door Rail: 10 inch high, square edge.
      c. Sidelight Top Rails: 4 inch high, square edge.
      d. Sidelight Bottom Rails: 4 inch high, square edge.
      e. Cladding Finish: Brushed stainless steel.
      f. Integral Lock: Bottom rail only.

B. Concealed Floor Closers and Top Pivots: Center hung; BHMA A156.4, Grade 1. Provide housings, bottom insert, top walking beam pivots, mounting plates, and accessories.
   2. Swing: Single-acting as indicated on Drawings.
   4. Opening Force: Comply with interior door operating force mandated by authorities having jurisdiction for accessibility requirements.
C. Pulls and Handles (Back-to-Back):
   1. Design: Vertical bar, 48-13/16 inch.

D. Lockset: Manufacturer's standard hook-bolt lockset.
   1. Bottom rail fitting dead bolt engaging a dust-proof strike, operated by key outside and
      thumb turn inside.

E. Lock Cylinder: As specified in Section 08 71 00.

2.04 MATERIALS
A. Glass: Flat glass meeting requirements of ASTM C1036, Type I - Transparent Flat Glass,
   Quality Q3, and Kind FT, fully tempered, in accordance with ASTM C1048, and as follows:
   1. Thickness: 1/2 inch.
   2. Color: Class 1, Clear.
   3. Prepare glazing panels for indicated fittings and hardware before tempering.
   4. Polish edges that will be exposed in finished work to bright flat polish.
   5. Temper glass materials horizontally; visible tong marks or tong mark distortions are not
      permitted.

B. Aluminum Components: Conforming to ASTM B221 (ASTM B221M), Alloy 6063, Temper T5.

C. Stainless Steel Components: Conforming to ASTM A666, Type 304.

D. Sealant: One-part silicone sealant, conforming to ASTM C920, clear.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that openings are acceptable.
B. Do not begin installation until substrates and openings have been properly prepared.
C. If substrate preparation is the responsibility of another installer, notify Contracting Officer's
   Representative of unsatisfactory preparation before proceeding.

3.02 PREPARATION
A. Clean substrates thoroughly prior to installation.
B. Prepare substrates using the methods recommended by the manufacturer for achieving the
   best result for the substrate under the project conditions.

3.03 INSTALLATION
A. Installation of cold-formed metal framing for openings as specified in Section 05 40 00.
B. Installation of miscellaneous structural steel framing for opening is specified in Section 05 50
   00.
C. Install in accordance with manufacturer's installation instructions.
D. Tolerances:
   1. Horizontal Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from
      level, non-cumulative.
   2. Vertical Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from
      plumb, non-cumulative.
   3. Variation from Plane or Indicated Location: Not more than 1/16 inch.
E. Installation of door hardware not supplied by entrance/storefront manufacturer as specified in
   Section 08 71 00.

3.04 ADJUSTING
A. Adjust doors to operate correctly, without binding to frame, sill, or adjacent doors.
B. Adjust door hardware for smooth operation.
3.05 CLEANING
   A. Clean installed work to like-new condition.

3.06 PROTECTION
   A. Protect installed products until Date of Substantial Completion.
   B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION
SECTION 08 42 29
AUTOMATIC ENTRANCES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Packaged power-operated door assemblies.
   B. Automatic sliding doors, with frames, for interior locations.
   C. Actuators and safety devices.
   D. Maintenance.

1.02 RELATED REQUIREMENTS
   A. Section 07 90 05 - Joint Sealers.
   B. Section 08 42 29.53 - Sliding Automatic Entrances (Blast Resistant).
   C. Section 08 71 00 - Door Hardware: Cylinder as required.
   D. Section 08 80 00 - Glazing.
   E. Division 26 - Electrical.

1.03 REFERENCE STANDARDS
   B. NEMA MG 1 - Motors and Generators; 2014.
   C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   D. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
   E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Shop Drawings:
      1. Indicate layout and dimensions; head, jamb, and sill conditions; elevations; components, anchorage, recesses, materials, and finishes, electrical characteristics and connection requirements.
      2. Identify installation tolerances required, assembly conditions, routing of service lines and conduit, and locations of operating components and boxes.
   C. Product Data: Provide data on system components, sizes, features, and finishes.
   D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.
   E. Maintenance Contract.
   F. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
   G. Maintenance Data: Include manufacturer's parts list and maintenance instructions for each type of hardware and operating component.
   H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
      1. See Section 01 60 00 - Product Requirements, for additional provisions.
      2. Wrenches and other tools required for maintenance of equipment.
1.05 QUALITY ASSURANCE
A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

1.06 PROJECT CONDITIONS
A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.07 WARRANTY
A. Correct defective Work within a five year period after Date of Substantial Completion.
B. Provide five year manufacturer warranty for operating unit.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Sliding Automatic Entrance Door Assemblies:

2.02 POWER OPERATED DOORS
A. Power Operated Doors: Provide products that comply with the requirements of the authorities having jurisdiction; unless otherwise indicated, provide equipment selected for the actual weight of the doors and for light pedestrian traffic.
   1. Sliding Door Operators: In the event of power failure, provide for manual open, close, and break-away operation of door leaves.
   2. Packaged Door Assemblies: Provide all components by single manufacturer, factory-assembled, including doors, frames, operators, actuators, and safeties.
      a. Finish exposed equipment components to match door and frame finish.
   3. Exterior and Vestibule Doors: Provide equipment suitable for operating temperature range of minus 20 to plus 140 degrees F ambient.
B. Sliding Doors with Full Power Operators: Comply with BHMA A156.10; safeties required; provide break-away operation unless otherwise indicated; in the event of break-away operation, interrupt power operation.
   1. Comply with UL 325; acceptable evidence of compliance includes UL (DIR) listing.
   2. Force Required to Swing Break-Away Panel: 50 pounds-force, maximum, measured at 1 inch from the latch edge of the door at any point in the closing cycle.

2.03 AUTOMATIC ENTRANCE DOORS
A. Automatic Sliding Door: Bi-parting double leaf track-mounted, electric operation, extruded aluminum glazed door, with frame, and operator concealed overhead.
   1. Operation: Power open, power close operation.
   2. "Outside" Side Actuator/Safety: Motion sensor.
   4. Hold Open: Toggle switch at inside head of doors; this is not a fire-rated door.
   5. Door and Frame Finish: Same as adjacent framing system: Dark bronze anodized finish.

2.04 CONTROLLERS, ACTUATORS, AND SAFETIES
A. Controller: Provide microprocessor operated controller for each door.
B. Comply with BHMA A156.10 for actuator and safety types and zones.
C. Motion Sensor Actuator/Safety: Passive infrared; distance of control sensitivity adjustable.

2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS
A. Provide shielded electrical devices at all locations.
B. Electrical Characteristics:
   1. Coordinate with Electrical drawings.
C. Motors: NEMA MG 1.
D. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
E. Disconnect Switch: Factory mount disconnect switch in control panel.

2.06 ACCESSORIES
A. Steel Clips, Supports, and Steel Anchors: Galvanized to 1.25 ounces per square foot.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that openings and recesses are ready to receive work and dimensions are as indicated on shop drawings.
B. Verify that electric power is available and is of the correct characteristics.

3.02 INSTALLATION
A. Install equipment in accordance with manufacturer's instructions.
B. Provide for thermal expansion and contraction of door and frame units and live and dead loads that may be transmitted to operating equipment.
C. Provide for dimensional distortion of components during operation.
D. Coordinate installation of components with related and adjacent work; level and plumb.

3.03 ADJUSTING
A. Adjust door equipment for correct function and smooth operation.

3.04 CLEANING
A. Remove temporary protection, clean exposed surfaces.

3.05 CLOSEOUT ACTIVITIES
A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.06 MAINTENANCE
A. Provide service and maintenance of operating equipment for one year from Date of Substantial Completion, at no extra charge to EXCHANGE.

END OF SECTION
SECTION 08 42 29.53
SLIDING AUTOMATIC ENTRANCES (BLAST RESISTANT)

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Blast resistant exterior and interior, single slide automatic entrances.
B. Blast resistant exterior and interior, bi-parting, sliding automatic entrances.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Sealants: Provision of sealants to the extent not specified in this section.
B. Section 08 71 00 - Door Hardware: Provision of hardware to the extent not specified in this Section.
C. Division 26 - Electrical: Electrical connections including conduit and wiring for power to, and control of, sliding automatic entrances.

1.03 REFERENCES

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
B. Underwriters Laboratories (UL):
   1. UL 325 – Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
C. General Services Administration (GSA):
   1. Building Classifications Level C
   2. Test Protocol GSA-TS01-2003
D. Unified Facilities Criteria (UFC):
   1. UFC 4-010-1 DoD Antiterrorism Standards for New and Existing Buildings
E. American National Standards Institute (ANSI) / Builders’ Hardware Manufacturers Association (BHMA):
   2. ANSI/BHMA A156.5: Standard for Auxiliary Locks and Associated Products
F. American Society for Testing and Materials (ASTM):
   2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
   3. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
   5. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
G. American Association of Automatic Door Manufacturers (AAADM):
H. National Fire Protection Association (NFPA):
I. National Association of Architectural Metal Manufacturers (NAAMM):
   1. Metal Finishes Manual for Architectural and Metal Products.
J. American Architectural Manufacturers Association (AAMA):
   1. AAMA 607.1 - Clear Anodic Finishes for Architectural Aluminum.
2. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.
3. AAMA 701 Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals.

1.04 DEFINITIONS
A. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to open the door.
B. Safety Device: Device that prevents a door from opening or closing, as appropriate.

1.05 PERFORMANCE REQUIREMENTS
A. General: Provide automatic entrance door assemblies capable of withstanding structural loads and thermal movements based on testing manufacturer’s standard units in assemblies similar to those indicated for this Project.
B. Thermal Movements: Provide automatic entrances that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
C. Operating Range: Minus 30 deg F (Minus 34 deg C) to 130 deg F (54 deg C).
D. Opening-Force Requirements for Egress Doors: Not more than 50 lbf (222 N) required to manually set door in motion if power fails, and not more than 15 lbf (67 N) required to open door to minimum required width.
E. Closing-Force Requirements: Not more than 30 lbf (133 N) required to prevent door from closing.
F. Sliding automatic entrances specified with automatic locking shall be designed to function as follows:
   1. Entrances shall be normally closed and locked by automatic locking system with exterior motion activation system disabled. Interior motion activation system to remain enabled; free egress.
   2. Upon signal from exterior secure activation device, sliding automatic entrances will unlock and open enabling motion activation system. Entrance will be held open as long as an object or pedestrian remains in the activation or safety zones.
   3. Once all activation and safety zones have cleared the entrance will close and re-lock, returning to normal state.
G. Structural properties of components:
   1. Deflection limitations
      a. The deflection of any framing member in a direction normal to the plane of the wall when subjected to the specified design loads shall not exceed l/175 of its clear span or 3/4 inch (19 mm) whichever is less.
      b. For cantilevers, the span shall be taken as two times the distance between anchor centerline and end of cantilever.
      c. The deflection shall not exceed 50% of the nominal joint width at sealant joints occurring between framing members and relatively stiff building elements, or less if required by sealant manufacturer.
      d. Upon reversal of load direction at magnitudes up to and including 1.5 times design pressures, slippage at fastened and/or clamped connections shall not exceed 1/8 inch (3 mm).
      e. Glass deflection at full design load shall not exceed 1/100 of its span, or 3/4 inch (19 mm) whichever is less.
      f. Metal panel deflection shall not exceed 1/90 of its span or 3/4 inch (19 mm) whichever is less. The span shall be taken as the lesser of the distances between the horizontal or vertical support members.
2. Structural design criteria and testing requirements.
   a. The work shall be designed to withstand the design loads and pressures specified herein. Compliance shall be demonstrated by calculations performed in accordance with accepted engineering practice.
   b. The work shall be designed to conform to ASTM E 330. Inward and outward acting test pressures shall be equal to 1.5 times the inward and outward acting design pressures to demonstrate a safety factor of 1.5 design pressures. Satisfactory performance at these loads shall mean no glass breakage, no permanent damage to fasteners or anchors, hardware, parts or actuating mechanisms; no malfunction of windows; no permanent deformation of main framing members in excess of 0.2% of their clear span.

H. Air Infiltration: The work shall be designed to conform to ASTM E 283. Differential static pressure shall be 6.24 psf (299 Pa). Any chamber leakage shall be accurately determined, not estimated. Air leakage of the fixed wall area shall not exceed 0.06 cfm (1.7 l/m) per 1 sf (929 scm) of exterior surface.

I. Water penetration
   1. The system shall be designed to conform to ASTM E 331 using a static pressure differential of 8 psf (383 Pa).
   2. Water penetration, in this specification, is defined as the appearance of uncontrolled water, other than condensation, on the indoor face of any part of the work.
   3. Provision shall be made to weep any water entering the system, other than condensation, to the exterior of the window.

J. The glazed framing system and its anchorage shall be designed to withstand normal recognized testing criteria to accept seismic movement without structural failure or glass breakage.

K. Blast Rating
   1. The complete system, framing, glazing and panels is designed to comply with GSA Level C and UFC 4-010-01.
   2. Proof of certification will be by structural engineering calculations for each job specific requirements. The structural engineering calculations shall confirm the structural capacity of the proposed opening to support the blast loads impacting the entrance system and related components. If calculations determine the need for additional structural support, supplemental support shall be provide under separate relevant sections.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

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

C. Engineering Calculations: When required by the architect, submit engineering calculations and supporting product data as required to confirm compliance with Performance Requirements. Calculations shall be prepared in accordance with common, accepted engineering practice and shall conform to appropriate design rules of the referenced standards and building ordinances. All documents are to bear the seal of a licensed engineer. Calculations shall include:
   1. Material specifications and properties.
   2. The derivation of member properties.
   3. Analyses of stress and deflections for all structural elements, connections and anchorages.
   4. Dimensioned drawings of extrusion shapes where required to support calculations
   5. Safety Factors

D. Color Samples for selection of factory-applied color finishes.

E. Closeout Submittals:
   2. Warranties.
1.07 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer’s authorized representative who is trained for installation and maintenance of units required for this Project.

B. Manufacturer Qualifications: A qualified manufacturer with a company certificate issued by AAADM.

C. Certifications: Automatic sliding door systems shall be certified by the manufacturer to meet performance design criteria in accordance with the following standards:
1. ANSI/BHMA A156.10.
3. UL 325
5. UFC 4-010-1.

D. Source Limitations: Obtain automatic entrance door assemblies through one source from a single manufacturer.

E. Product Options: Drawings indicate sizes, profiles, and dimensional requirements of automatic entrance door assemblies and are based on the specific system indicated. Refer to Section 01 60 00 - Product Requirements.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

G. Emergency-Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrances serving as a required means of egress.

1.08 PROJECT CONDITIONS

A. Field Measurements: General Contractor shall verify openings to receive automatic entrance door assemblies by field measurements before fabrication and indicate measurements on Shop Drawings.

B. Mounting Surfaces: General Contractor shall verify all surfaces to be plumb, straight and secure; substrates to be of proper dimension and material.

C. Other trades: General Contractor shall advise of any inadequate conditions or equipment.

1.09 COORDINATION

A. Templates: Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing automatic entrances to comply with indicated requirements.

B. Building Structure: Review and confirm structural capacity of entrance substrate as required for proper frame anchoring.

C. Electrical System Roughing-in: Coordinate layout and installation of automatic entrance door assemblies with connections to power supplies, remote activation devices, and security access control system.

D. System Integration: Integrate sliding automatic entrances with other systems as required for a complete working installation.
   1. Provide electrical interface control capability for operation of sliding automatic entrances by secure activation system on doors with electric locking.

1.10 WARRANTY

A. Automatic Entrances shall be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

B. During the warranty period the Owner shall engage a factory-trained technician to perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.

C. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal working hours.
PART 2 - PRODUCTS

2.01 AUTOMATIC ENTRANCES
   A. Manufacturer: Basis-of-Specification is Stanley Access Technologies; Dura-Shield™ Blast High Security Series sliding automatic entrances.
   B. Substitutions: Subject to compliance with the requirements of this section and Section 00 04 04-Substitutions, assemblies from Besam-USA may be considered.

2.02 MATERIALS
   A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
      2. Framing, stiles and rails: 6105-T5
      3. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221.
   B. Sealants and Joint Fillers: Performed under Section 07 92 00 - Joint Sealants.

2.03 AUTOMATIC ENTRANCE DOOR ASSEMBLIES
   A. General: Provide manufacturer's standard automatic entrance door assemblies including doors, sidelights, framing, headers, carrier assemblies, roller tracks, door operators, activation and safety devices, and accessories required for a complete installation.
   B. Sliding Automatic Entrances:
      1. Single Slide Entrances:
         a. Configuration: One sliding leaf and one full sidelight.
         d. Mounting: Between jambs.
      2. Bi-Part sliding doors:
         a. Configuration: Two sliding leaves and two or more full sidelights, as indicated.
         d. Mounting: Between jambs.

2.04 COMPONENTS
   A. Framing Members: Manufacturer’s standard extruded aluminum reinforced as required to support imposed loads.
      1. Nominal Size: 2 1/2 inch by 6 inch (63.5 mm by 152.4 mm).
   B. Stile and Rail Doors and Sidelights: Manufacturer's standard 2 3/8 inch (60.3 mm) thick glazed doors with extruded-aluminum tubular stile and rail members. Incorporate concealed tie-rods that span full length of top and bottom rails or mechanically fasten corners with reinforcing brackets that are welded.
      2. Stile Design: 2 3/4 inch (70 mm) to 5 inch (127 mm) nominal width.
      3. Top Rail Design: 2 3/4 inch (70 mm) nominal height
      4. Bottom Rail Design: 2 3/4 inch (70 mm) to 8 1/2 inch (216 mm) nominal height.
      5. Muntin Bars: Horizontal tubular rail member for each door; 1 5/8 inch (41 mm) nominal height.
   C. Glazing: Provide insulated and laminated glazing units for sliding automatic entrances in composed of the following elements:
      1. 1/4 inch (6 mm) clear tempered Low E glass, PPG Sungate 500.
      2. Laminate glazing units, 1/8 inch (3 mm) inner and outer panes, clear, heat strengthened with 0.060 inch (1.5 mm) clear PVB interlayer.
      3. 1/2 inch (13 mm) air space.
D. Headers: Fabricated from extruded aluminum and extending full width of automatic entrance door units to conceal door operators, carrier assemblies, and roller tracks. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.
   1. Mounting: Surface applied to structural framing system.
   2. Capacity: Capable of supporting doors up to 400 lb (182 kg) per leaf over spans up to 14 feet (4.3 m) without intermediate supports.

E. Carrier Assemblies and Overhead Roller Tracks: Manufacturer's standard carrier assembly that allows vertical adjustment of at least 1/8 inch; consisting of urethane with precision steel lubricated ball-bearing wheels, operating on a continuous roller track. Support doors from carrier assembly by 2 inch diameter anti-riser wheels with factory adjusted cantilever and pivot assembly. Minimum four ball-bearing roller wheels and two anti-rise rollers for each active leaf.
   1. Minimum Load Wheel Diameter: 2 1/2 inch (64 mm).

F. Thresholds: Manufacturer's standard thresholds as indicated below:
   1. Standard extrusion track under sidelights.
   2. All thresholds to conform to details and requirements for code compliance.

G. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, non-staining, non-bleeding fasteners and accessories compatible with adjacent materials.

H. Signage: Provide signage in accordance with ANSI/BHMA A156.10.

2.05 DOOR OPERATORS

A. General: Provide door operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, operation under normal traffic load for type of occupancy indicated.

B. Electromechanical Operators: Two (2) self-contained overhead units, 1/4 horsepower minimum, permanent-magnet DC motors with gear reduction drives, microprocessor controller; and encoder.
   2. Features:
      a. Adjustable opening and closing speeds.
      b. Adjustable back-check and latching.
      c. Adjustable braking.
      d. Adjustable hold-open time between 0 and 30 seconds.
      e. Obstruction recycle.
      f. On/Off switch to control electric power to operator.
      g. Energy conservation switch that reduces door-opening width.
      h. Variable rate open/closed speed control.
      i. Closed loop speed control with active braking and acceleration.
      j. Variable obstruction recycle time delay.
      k. Self adjusting stop position.
      l. Self adjusting closing compression force.
      m. Optional Switch to open/Switch to close operation.
   4. Drive System: Synchronous belt type.

C. Electrical service to door operators shall be provided under Division 26 - Electrical. Minimum service to be 120 VAC, 10 amps.

2.06 ELECTRICAL CONTROLS

A. Electrical Control System: Electrical control system shall include a microprocessor controller and position encoder. The encoder shall monitor revolutions of the operator shaft and send signals to microprocessor controller to define door position and speed. Systems utilizing external magnets and magnetic switches are not acceptable. A single controller shall be capable of controlling up to two (2) operators per entrance system.
B. Life Cycle Data Counter: The electrical control system shall incorporate a non-re-settable counter to track door operation cycles.

C. Controller Protection: The microprocessor controller shall incorporate the following features to ensure trouble free operation:
   2. Main Fuse Protection.
   3. Electronic Surge Protection.
   5. Resettable sensor supply fuse protection.

D. Soft Start/Stop: A “soft-start” “soft-stop” motor driving circuit shall be provided for smooth normal opening and recycling.

E. Obstruction Recycle: Provide system to recycle the sliding panels when an obstruction is encountered during the closing cycle. If an obstruction is detected, the system shall search for that object on the next closing cycle by reducing door closing speed prior to the previously encountered obstruction location, and will continue to close in check speed until doors are fully closed, at which time the doors will reset to normal speed. If obstruction is encountered again, the door will come to a full stop. The doors shall remain stopped until obstruction is removed and operate signal is given, resetting the door to normal operation.

F. Programmable Controller: Microprocessor controller shall be programmable and shall be designed for connection to a local configuration tool. Local configuration tool shall be software driven and shall be utilized via Palm® handheld interface. The following parameters may be adjusted via the configuration tool:
   1. Operating speeds and forces as required to meet ANSI/BHMA A156.10.
   2. Adjustable and variable features as specified in 2.05, B., 2.
   3. Reduced opening position.
   4. Fail Safe/Secure control.
   5. Firmware update.
   6. Trouble Shooting
      a. I/O Status.
      b. Electrical component monitoring including parameter summary.
   7. Software for local configuration tool shall be available as a free download from the sliding automatic entrance manufacturer’s internet site.

2.07 ACTIVATION AND SAFETY DEVICES

A. Motion Sensors: Motion sensors shall be mounted on each side of door header to detect pedestrians in the activating zone, and to provide a signal to open doors in accordance with ANSI/BHMA A156.10. Units shall be programmable for bi-directional or uni-directional operation and shall incorporate K-band microwave frequency to detect all motion in both directions.

B. Presence Sensors: Presence sensors shall be provided to sense people or objects in the threshold safety zone in accordance with ANSI/BHMA A156.10. Units shall be self-contained, fully adjustable, and shall function accordingly with motion sensors provided. The sensor shall be enabled simultaneously with the door-opening signal and shall emit an elliptical shaped infrared presence zone, centered on the doorway threshold line. Presence sensors shall be capable of selectively retuning to adjust for objects which may enter the safety zone; tuning out, or disregarding, the presence of small nuisance objects and not tuning out large objects regardless of the time the object is present in the safety zone. The door shall close only after all sensors detect a clear surveillance field.

C. Photoelectric Beams: In addition to the threshold sensor include a minimum of two (2) doorway holding beams. Photoelectric beams shall be pulsed infrared type, including sender receiver assemblies for recessed mounting.
2.08 HARDWARE

A. General: Provide units in sizes and types recommended by automatic entrance door and hardware manufacturers for entrances and uses indicated.

B. Deadlocks: Manufacturer's standard deadbolt operated by exterior cylinder and interior thumb turn; with minimum 1 inch (25 mm) long throw bolt; ANSI/BHMA A156.5, Grade 1.
   1. Cylinders: As specified in Section 08 71 00 - Door Hardware.
   2. Hook Latch: Laminated-steel hook, mortise type, BHMA A156.5, Grade 1.

C. Automatic Locking System: Provide automatic locking hardware on designated doors described as follows:
   1. System shall include a fail-secure electric solenoid locking device with a self contained solid state electronic control factory mounted inside the header.
   2. The automatic sliding door(s) shall self latch in the closed position preventing door panels from sliding manually, returning the system to its locked status.
   3. During a power interruption:
      a. The solenoid lock shall be engaged, preventing the doors from sliding manually.
      b. Means of egress shall be accomplished by standard emergency breakaway feature.

D. Fly Open Box: Provide Fly Open Box on designated doors in accordance with the following:
   1. Fly Open Box shall be a fully integrated unit designed to fit within the door header and shall be UL listed for operation with the sliding automatic entrances provided herein.
   2. Upon main power interruption to the door:
      a. The Fly Open Box shall supply power to the operator of the sliding automatic entrance door.
      b. The Fly Open Box shall provide one open or close operation.
   3. Fly Open Box shall be configured for connection to a fire alarm system such that a signal from the fire alarm will open doors until fire alarm signal is terminated.

E. Control Switch: Provide manufacturer’s standard rotary switch mounted on the interior jamb to allow for full control of the automatic entrance door. Rotary switch shall be keyed on entrances with automatic locking. Controls to include, but are not limited to:
   1. Power On/Off
   2. One-way traffic
   3. Reduced Opening
   4. Open/Closed/Automatic

F. Sliding Weather Stripping: Manufacturer's standard replaceable components complying with AAMA 701; made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

G. Weather Sweeps: Manufacturer's standard adjustable nylon brush sweep mounted to underside of door bottom.

2.09 FABRICATION

A. General: Factory fabricates automatic entrance door assembly components to designs, sizes, and thickness indicated and to comply with indicated standards.
   1. Form aluminum shapes before finishing.
   2. Use concealed fasteners to greatest extent possible.
      a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
      b. Reinforce members as required to receive fastener threads.

B. Framing: Provide automatic entrances as prefabricated assemblies.
   1. Fabricate tubular and channel frame assemblies with manufacturer's standard mechanical or welded joints. Provide sub-frames and reinforcement as required for a complete system to support required loads.
   2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
3. Form profiles that are sharp, straight, and free of defects or deformations.
4. Prepare components to receive concealed fasteners and anchor and connection devices.
5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.

C. Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.
D. Door Operators: Factory fabricated and installed in headers, including adjusting and testing.
E. Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated.
F. Hardware: Factory install hardware to the greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site.

2.10 ALUMINUM FINISHES
A. General: Comply with NAAMM Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designing finishes. Finish designations prefixed by AA comply with system established by Aluminum Association for designing finishes.
B. Class II, Clear Anodic Finish: AA-M10C22A31 Mechanical Finish: as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.40 mils minimum complying with AAMA 611-98, and the following:
   1. AAMA 607.1
   2. Applicator must be fully compliant with all applicable environmental regulations and permits, including wastewater and heavy metal discharge.

PART 3 - EXECUTION
3.01 INSPECTION
A. Examine conditions for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION
A. General: Do not install damaged components. Fit frame joints to produce joints free of burrs and distortion. Rigidly secure non-movement joints.
B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
   1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
   2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
C. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.
D. Glazing: Glaze sliding automatic entrance door panels in accordance with, published recommendations of glass product manufacturer, and sliding automatic entrance manufacturer’s instructions.
E. Sealants: Comply with requirements specified in Section 07 92 00 - Joint Sealants to provide weather tight installation.

3.03 FIELD QUALITY CONTROL
A. Testing Services: Factory Trained Installer shall test and inspect each automatic entrance door to determine compliance of installed systems with applicable ANSI standards.

3.04 ADJUSTING
A. Adjust door operators, controls, and hardware for smooth and safe operation, for weather-tight closure, and complying with requirements in ANSI/BHMA A156.10.
3.05 CLEANING AND PROTECTION

A. Clean glass and aluminum surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish. Comply with requirements in Section 08 80 00 - Glazing, for cleaning and maintaining glass.

END OF SECTION
SECTION 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

1.02 RELATED SECTIONS
A. Section 06 40 23 - Interior Architectural Woodwork: Cabinet hardware.
B. Section 08 11 13 - Hollow Metal Doors and Frames.
C. Section 08 14 16 - Flush Wood Doors.
D. Section 08 33 23 - Overhead Coiling Doors.
E. Section 08 33 26 - Overhead Coiling Grilles.
F. Section 08 39 53 - Blast Resistant Steel Door and Frame Assemblies.
G. Section 08 41 13 - Aluminum Entrances and Storefronts.
H. Section 08 41 13.53 - Aluminum Storefronts (Blast Resistant).
I. Section 08 41 26 - All-Glass Entrances and Storefronts (Interior).
J. Section 08 42 29 - Automatic Entrances.
K. Section 08 42 29.53 - Sliding Automatic Entrances (Blast Resistant).

1.03 REFERENCES
A. AWI (Architectural Woodwork Institute) – Architectural Woodwork Quality Standards
B. BHMA (Builders Hardware Manufacturers Association)
C. DHI (Door and Hardware Institute)
D. NFPA 80 – Fire Doors and Windows
F. NFPA 252 – Fire Tests of Door Assemblies
G. UL 10B – Safety Fire Tests of Door Assemblies

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
   1. Type, style, function, size, and finish of each hardware item.
   2. Name and manufacturer of each item.
   3. Fastenings and other pertinent information.
   4. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
   5. Explanation of all abbreviations, symbols, and codes contained in schedule.
   6. Mounting locations for hardware.
   7. Door and frame sizes and materials.
C. Maintenance Data: Include data on operating hardware, lubrication requirements and inspection procedures related to preventative maintenance.
D. Keys: Deliver with identifying tags to local facility EXCHANGE General Manager by security shipment direct from hardware supplier.
E. Warranty: Submit manufacturer warranty and ensure forms have been completed in EXCHANGE’s name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.

B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the Project’s vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

C. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by UL, Warnock Hersey, FM, or other testing and inspecting organization acceptable to authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels. If automatic self-latching bolts, coordinators, and astragals are required they shall be furnished.

D. Submit fire test data showing compliance with UBC Std. 7-2 and supplemental “S” label requirements.

E. Hardware: Coordinate products used during fire tests meeting UBC 7-2 and ICBO AC84, including component gasket system for “S” labeled openings. All hardware must provide an acceptable means of egress to the Building Official.

1.06 PRODUCT HANDLING

A. Tag each item, or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Deliver all hardware to the General Contractor in a timely manner to ensure orderly progress of the total work.

C. The General Contractor shall receive, take charge of, and distribute hardware at the building. General Contractor shall provide and arrange temporary shelving for the storage of all hardware.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Submittals for approved substitutions must be received no later than 10 days before bid date. Only requests for substitutions submitted by a distributor firm will be considered. No substitutions will be allowed after bid opening.

1. Hinges: Unless otherwise noted provide 5-knuckle, button tip, full mortise template type butts with non-rising pins, plain or ball-bearing as indicated. Provide non-removable pins for all out-swinging doors with locksets.
   a. Bommer Industries, Inc.
   b. Hager Hinge Co.
   c. Ives, Div. Ingersoll-Rand
   d. McKinney Products Co.
   e. Stanley Hardware, Div. Stanley Works.

2. Key Control System:
   a. Key Control Systems, Inc.
   b. Telkee Inc.

3. Locks: Locks and latches shall be full mortise type 1000, grade 1, in accordance with BHMA/ANSI A156.13 All locks shall be have interchangeable cores. All cylinders shall be provided with temporary construction cores.
a. Best Access Systems
b. Falcon Lock, Div. Ingersoll-Rand Door Hardware Group
c. Arrow Lock, Div. Assa Abloy Group

4. Deadbolt Locks:
   a. Adams Rite

5. Cylinders:
   a. Best Access Systems
   b. Falcon Lock, Div. Ingersoll-Rand Door Hardware Group
   c. Arrow Lock, Div. Assa Abloy Group

6. Bolts:
   a. Triangle Brass Manufacturing Company (Trimco)
   b. Ives, Div. Ingersoll-Rand Door Hardware Group
   c. Rockwood Mfg. Company

7. Overhead Closers / Auto. Operators:
   a. LCN Closers, Div. Ingersoll-Rand Door Hardware Group
   b. Norton Door Closers, Div. Yale Security Group

8. Door Control Devices:
   a. Rockwood Mfg. Company
   b. Ives, Div. Ingersoll-Rand Door Hardware Group
   c. Triangle Brass Manufacturing Company (Trimco)

9. Door Trim Units:
   a. Rockwood Mfg. Company
   b. Ives, Div. Ingersoll-Rand Door Hardware Group
   c. Triangle Brass Manufacturing Company (Trimco)

10. Kick, Mop, and Armor Plates:
    a. Rockwood Mfg. Company
    b. Ives, Div. Ingersoll-Rand Door Hardware Group
    c. Triangle Brass Manufacturing Company (Trimco)

11. Door Stripping and Seals; Astragals:
    a. National Guard Products, Inc.
    b. Pemko Manufacturing Co., Inc.
    c. Reese Enterprises, Inc.

12. Thresholds:
    a. McKinney, an Assa Abloy Group company.
    b. National Guard Products, Inc.
    c. Pemko Manufacturing Co., Inc.
    d. Reese Enterprises, Inc.

13. Automatic Drop Seals:
    a. National Guard Products, Inc.
    b. Pemko Manufacturing Co., Inc.
    c. Reese Enterprises, Inc.

14. Exit Devices:
    a. Exit devices shall be modern style ANSI A156.3 grade 1.
    a. Von Duprin, Div. Ingersoll-Rand Hardware Group
    b. Sargent, Div. Assa Abloy
    c. Precision Hardware, Inc.

2.02 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in the "Hardware Schedule" at the end of this Section. Products are identified by using hardware designation numbers of the following:

1. Butts and Hinges: Stanley Hardware
2. Locks: Best Access Systems
3. Deadbolt Locks: Adams Rite
4. Exit/Panic Devices: Von Duprin, Div Ingersoll-Rand Hardware Group
6. Overhead Closers: LCN Closers, Div Ingersoll-Rand Hardware Group
7. Door Controls: Glynn-Johnson, Div Ingersoll-Rand Hardware Group
8. Door Controls: Ives, Div Ingersoll-Rand Hardware Group
9. Thresholds: McKinney, an Assa Abloy Group company
10. Door Stripping and Seals: Pemko Manufacturing Co., Inc.
12. Bolts: Ives, Div Ingersoll-Rand Hardware Group
13. Exit Alarms: Detex Corporation
14. Door Viewers: Du Seung Trading Corporation

2.03 LOCK CYLINDERS AND KEYING
A. All cylinders shall be keyed as directed by Owner, integrated into Grandmaster key system.
B. All cylinders shall be factory keyed and masterkeyed as directed.

2.04 ELECTRONIC HARDWARE
A. Provide a complete description of how each electronic hardware system should function.
B. Provide complete wiring diagrams, riser drawings and installation instructions for each system.

PART 3 - EXECUTION

3.01 INSTALLATION:
A. Mount hardware units at heights indicated in Recommended Locations for Builders Hardware for Standard Steel Doors and Frames” by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.
B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.
C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
D. Drill and counter sink units which are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.02 ADJUST AND CLEAN:
A. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustments of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilation equipment.
B. Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finish during the final adjustment of hardware.
C. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials, or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.
3.03 DOOR HARDWARE SCHEDULE - SEE ATTACHMENT

END OF SECTION
HARDWARE SETS

Hardware sets indicate quantity, item, manufacturer and product designation, size, and finish or color, as applicable.

Hardware - 1
Overhead doors; Automatic doors; All-glass entrances:
Doors 102, 103, 104, 106, 110, 111, 112, 122c, 152, 166, 166a

1 Each Cylinder 1E72/1E74 US26D As Required
All Other Hardware by Door Manufacturer

Hardware – 2
Aluminum Storefront Entry Doors:
Doors 122a, 122b

1 Each Continuous Hinge CFM83HD1
1 Each Exit Device 3347EO US26D
1 Each Cylinder 1E74 US26D
1 Each Pull BF157 US32D
1 Each Closer 2030 Alum Lacq
1 Each Floor Stop FS18-S
1 Each Threshold MCKR.5OSSMRAK
1 Each Rain Drip 346C
1 Each Security Switch 1076W
Weatherseals and Door Bottoms by Door Manufacturer

Hardware – 3
Pair Aluminum Storefront Entry Doors, with Mullion:
Doors 104a

2 Each Continuous Hinge CFM83HD1
2 Each Exit Device 3347EO US26D
2 Each Cylinder 1E74 US26D
2 Each Pull BF157 US32D
2 Each Closer 2030 Alum Lacq
2 Each Floor Stop FS18-S
1 Each Threshold MCKR.5OSSMRAK
1 Each Rain Drip 346C
2 Each Security Switch 1076W
Weatherseals and Door Bottoms by Door Manufacturer
### Hardware – 5
**Storage Doors, Security Office Doors:**
Doors 102a, 103a, 140, 165

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<th>Qty</th>
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<td>3</td>
<td>Each Hinges</td>
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<td>Each Lock</td>
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<td>1</td>
<td>Each Wall Stop</td>
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<td>Each Kickplate</td>
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<tr>
<td>3</td>
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### Hardware - 6
**Exterior Service Doors:**
Door 112c

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All Other Hardware by Door Manufacturer

### Hardware – 7
**Double-acting Service Doors:**
Door 152a

All Hardware by Door Manufacturer

### Hardware - 10
**Office Doors:**
Doors 117, 119, 142, 149

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<td>Each Lock</td>
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<td>Each Cylinder</td>
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<tr>
<td>1</td>
<td>Each Closer</td>
<td>4011 Alum Lacq or 4111 Alum Lacq, as applicable</td>
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<td>Each Wall Stop</td>
<td>WS402CCV US26D</td>
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<td>Each Kickplate</td>
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### Hardware - 11
**Public Room Doors:**
Door 112a

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<td>Each Closer</td>
<td>4111 Alum Lacq</td>
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<td>1</td>
<td>Each Wall Stop</td>
<td>WS402CCV US26D</td>
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<td>1</td>
<td>Each Kickplate</td>
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Hardware – 12  
**Private Toilet Room Doors:**  
Doors 120, 121  

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Hardware - 13  
**Pairs of Storage Room Doors:**  
Doors 164, 168, 170  

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<tr>
<td>Lock</td>
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Hardware - 17  
**Interior Aluminum Storefront Doors:**  
Door 167  

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Pivots and weatherstripping by Door Manufacturer

Hardware – 19  
**Exterior Service Pairs of Doors:**  
Door 119a  

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
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<td>1E74 US26D</td>
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<tr>
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<td>2</td>
<td>4111 Alum Lacq</td>
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<td>Floor Stop/Holder</td>
<td>2</td>
<td>FS446 US26D</td>
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<td>Kickplate</td>
<td>2</td>
<td>10&quot; x 2&quot; LDW US32D</td>
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<td>Viewer</td>
<td>2</td>
<td>DoorScope US28</td>
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<td>Door Bottom</td>
<td>2</td>
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<td>Rain Drip</td>
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All Other Hardware by Door Manufacturer
Hardware - 20  
**Emergency Exit Doors:**  
Door 113

<table>
<thead>
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<tbody>
<tr>
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<td>Alarmed Exit Device</td>
<td>Detex ECL-230X IP SN1</td>
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<td>Closer</td>
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<td>Floor Stop</td>
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All Other Hardware by Door Manufacturer

Hardware - 23  
**Exterior Gates:**  
Doors 123, 169a, 169b

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<td>Padlock</td>
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All Other Hardware by Door Manufacturer

Hardware - 31  
**MPA Area Service Doors:**  
Door 151

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<tr>
<td>3</td>
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<td>Hinges</td>
<td>FBB168 4.5 x 4.5 US26D NRP</td>
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<td>1</td>
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<td>Lock</td>
<td>45H7D5H US26D</td>
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<tr>
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<td>Closer</td>
<td>4011 Alum Lacq</td>
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<td>Wall Stop</td>
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<tr>
<td>1</td>
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<td>Kickplate</td>
<td>30” x 2” LDW US32D</td>
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<tr>
<td>1</td>
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<td>Gasket</td>
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</tbody>
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END OF SECTION
SECTION 08 80 00
GLAZING

PART 1 - GENERAL
1.01 SUMMARY
A. This Section includes glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:
   1. Storefront framing and doors.
   2. Automatic Entrances.

1.02 RELATED REQUIREMENTS
A. Section 08 41 13 - Aluminum Entrances and Storefronts.
B. Section 08 41 13.53 - Aluminum Storefronts (Blast Resistant).
C. Section 08 41 26 - All-Glass Entrances and Storefronts (Interior): Glass for all-glass entrances and storefronts (interior).
D. Section 08 42 29 - Automatic Entrances.
E. Section 08 42 29.53 - Sliding Automatic Entrances (Blast Resistant).

1.03 DEFINITIONS
A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.
B. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use due to causes other than glass breakage and improper practices for maintaining, and cleaning insulating glass. Evidence of failure is the obstruction of vision by dust, moisture, or film on the interior surfaces of glass. Improper practices for maintaining and cleaning glass do not comply with the manufacturer's directions.

1.04 PERFORMANCE REQUIREMENTS
A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
B. Glass Design: Glass thicknesses indicated on the drawings and in the schedule at the end of this Section are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
   1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
      a. Specified Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in miles per hour (meters per second) at 33 feet (10 m) above grade, according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.4.2, "Analytic Procedure," based on mean roof heights above grade indicated on Drawings or if not indicated, wind speed of 70 mph, exposure by design pressure 15 psf.
      b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action for load duration of 60 seconds or less.
      c. Maximum Lateral Deflection: For the following types of glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch (25 mm), whichever is less.
         1) For monolithic-glass lites heat treated to resist wind loads.
2) For insulating glass.
3) For laminated-glass lites.
   (a) Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.

C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.05 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product data for each glass product and glazing material indicated.
C. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.
   1. Separate certifications are not required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program of a recognized certification agency or independent testing agency acceptable to authorities having jurisdiction.
D. Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.

1.06 QUALITY ASSURANCE
A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. FGMA Publications: "FGMA Glazing Manual."
   2. LSGA Publications: "LSGA Design Guide."
   1. Provide safety glazing at locations required in the 2015 IBC Section 2406.
C. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency indicated below:
   1. Insulating Glass Certification Council (IGCC).
D. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.
E. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
   1. Primary glass of each (ASTM C 1036) type and class indicated.
   2. Laminated glass of each (ASTM C 1172) kind indicated.
   3. Insulating glass of each construction indicated.
F. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
1.07 DELIVERY, STORAGE, AND HANDLING
   A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
   B. Where insulating glass units will be exposed to substantial altitude changes, comply with insulating glass fabricator's recommendations for venting and sealing to avoid hermetic seal ruptures.

1.08 PROJECT CONDITIONS
   A. Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.
   B. Install liquid sealants at ambient and substrate temperatures above 40 deg F (4.4 deg C).

1.09 WARRANTY
   A. General: Warranties specified in this Article shall not deprive AAFES of other rights AAFES may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
   B. Manufacturer's Warranty on Insulating Glass: Submit written warranty signed by manufacturer of insulating glass agreeing to furnish replacements for insulating glass units that deteriorate as defined in "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, protecting, and maintaining practices contrary to glass manufacturer's published instructions.
      1. Warranty Period: Manufacturer's standard but not less than 10 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
   A. Manufacturers: Subject to compliance with requirements, glass products as manufactured by one of the following companies may be used.
      1. AFG Industries, Inc.
      2. Saint-Gobain.
      3. Ford Glass Division.
      4. LOF Glass, Inc.
      5. Guardian Industries Corp.
      6. PPG Industries, Inc.

2.02 HEAT-TREATED FLOAT GLASS PRODUCTS, GENERAL
   A. Fabrication Process: By vertical (tong-held) or horizontal (roller-hearth) process, at manufacturer's option, except provide horizontal process where indicated as tongless or free of tong marks.

2.03 HEAT-TREATED FLOAT GLASS
   A. Uncoated, Clear, Heat-Treated Float Glass (Symbol "T"): ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), kind FT (fully tempered).
      1. ¼” thick.
   B. Accessories:
      1. Slotted Hardware: Garcy No. 1747.

2.04 INSULATING GLASS PRODUCTS
   A. Use at all exterior locations.
B. Sealed Insulating Glass Units: Preassembled units consisting of organically sealed lites of glass separated by dehydrated air spaces complying with ASTM E 774 and with other requirements indicated.
   1. For properties of individual glass lites making up units, refer to requirements specified in this Section applicable to types, classes, kinds, and conditions of glass products comprising lites of insulating glass units.
   2. Provide heat-treated, uncoated float glass of kind indicated or, if not otherwise indicated, Kind HS (heat strengthened) where recommended by manufacturer to comply with system performance requirements specified and Kind FT (fully tempered) where safety glass is designated or required.
   3. U-values are expressed as Btu/hour x sq. ft. x deg F.

C. Air Space Width: Nominal size measured perpendicularly from surfaces of glass lites at unit’s edge.

D. Spacer Specifications:
   1. Dessicant: Either molecular sieve or silica gel or blend of both.
   2. Corner Construction: Manufacturer’s standard corner construction.

E. Low-E Insulating Glass (Symbol IG): Provide low-emissivity insulating-glass units complying with the following at all exterior non-blast-resistant locations:
   1. Overall Unit Thickness: 1” thick.
   2. Interspace Content: Air.
      a. Thickness: 1/2” thick nominal.
   3. Indoor Lite: Kind FT Fully Tempered, ¼” thick.
      a. Class 1 (clear)
   4. Outdoor Lite: Kind FT Fully Tempered, ¼” thick
      a. Class 1 (clear).
      b. PPG-Sungate 100 Low E provided on second surface.

F. Low-E Insulating Glass - Blast Resistant (Symbol IGBR): Provide low-emissivity insulating-glass units complying with the following at all blast-resistant locations:
   1. Overall Unit Thickness: 1-5/16” thick.
   2. Interspace Content: Air.
      a. Thickness: 1/2” thick nominal.
   3. Indoor Lite:
      a. 9/16” clear laminated (.060 clear pvb).
   4. Outdoor Lite: Kind FT Fully Tempered, ¼” thick
      a. Class 1 (clear).
      b. PPG-Sungate 100 Low E provided on second surface.

2.05 ELASTOMERIC GLAZING SEALANTS

A. General: Comply with sealant and glass manufacturer’s recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation:
   1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
   2. Colors: Provide color of exposed joint sealants to match adjacent surfaces to be sealed. Refer uncertain areas to Contracting Officer; colors will be will selected from manufacturer's full range of standard colors.

B. Elastomeric Glazing Sealant Standard: Provide manufacturer’s standard chemically curing, elastomeric sealants that comply with ASTM C 920 requirements for Type, Grade, Class and Uses suitable for conditions shown and as recommended by manufacturer.
2.06 GLAZING TAPES
A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent, nonstaining and nonmigrating in contact with nonporous surfaces, with or without spacer rod as recommended by tape and glass manufacturers for application indicated, packaged on rolls with a release paper backing, and complying with AAMA 800 for product type provided.
B. Expanded Cellular Glazing Tape: Closed-cell, polyvinyl chloride foam tape, factory coated with adhesive on both surfaces, packaged on rolls with release liner protecting adhesive, and complying with AAMA 800 for product 810.5.

2.07 GLAZING GASKETS
A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
   1. EPDM, ASTM C 864.

2.08 MISCELLANEOUS GLAZING MATERIALS
A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.
B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.
D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).

2.09 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS
A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Examine glass framing, with glazier present, for compliance with the following:
   1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
   2. Presence and functioning of weep system.
   3. Minimum required face or edge clearances.
   4. Effective sealing between joints of glass-framing members.
B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.03 GLAZING, GENERAL
A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.
B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass from edge damage during handling and installation as follows:
   1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
   2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
   1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
   2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

### 3.04 TAPE GLAZING

A. Position tapes on fixed stops so that when compressed by glass their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously but not in one continuous length. Do not stretch tapes to make them fit opening.

C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each lite is installed.

F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

### 3.05 SEALANT GLAZING (WET)

A. Install continuous spacers between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

3.06 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

E. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.07 GLASS SCHEDULE

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<tr>
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<th>TYPE</th>
<th>LOCATION (Where indicated and: )</th>
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<tbody>
<tr>
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<td>Safety Glass</td>
<td>Interior doors &amp; where required by IBC 2406 and at shelving.</td>
</tr>
<tr>
<td>IG</td>
<td>1&quot; insulating, &quot;Clear,&quot; tempered, low E coated</td>
<td>Exterior non-blast-resistant storefront &amp; doors.</td>
</tr>
<tr>
<td>IGBR</td>
<td>1-5/16&quot; insulating &quot;Clear&quot; laminated low E coated</td>
<td>Blast resistant storefront &amp; doors.</td>
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END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Performance criteria for gypsum board assemblies.
B. Metal stud interior wall framing.
C. Metal channel ceiling framing.
D. Acoustic insulation.
E. Gypsum wallboard.
F. Glass-mat-faced gypsum wallboard.
G. Coated glass-mat-faced gypsum backing board.
H. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS
A. Section 05 40 00 - Cold Formed Metal Framing: Metal stud framing heavier than 20 gage; glass-mat-faced exterior wall sheathing.
B. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
C. Section 07 21 00 - Thermal Insulation: Batt insulation at exterior walls.
D. Section 07 84 00 - Firestopping: Top-of-wall assemblies at fire rated walls.
E. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board work.
F. Section 09 30 00 - Tiling.
G. Section 09 90 00 - Painting.

1.03 REFERENCE STANDARDS
A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
I. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
P. ASTM E413 - Classification for Rating Sound Insulation; 2010.
R. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
C. Product Data: Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.
D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 3 years of experience.

PART 2 PRODUCTS
2.01 GYPSUM BOARD ASSEMBLIES
A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.
B. Typical Interior Partitions: Unless otherwise indicated, provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 47, minimum, calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
      a. All interior partitions shall have full thickness acoustic insulation filling the stud cavities.
C. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.
   1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 METAL FRAMING MATERIALS
A. Manufacturers - Metal Framing, Connectors, and Accessories:
B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing as follows:
   1. Maximum Deflection:
      a. Typical Drywall Partitions: L/240 at 5 psf, unless otherwise indicated.
1) All interior metal studs shall be minimum 20 gage, 3-5/8 inches deep, unless otherwise indicated.
   b. Veneer Assemblies: L/360 at 5 psf.
      1) Veneer assemblies include drywall partitions with ceramic tile, porcelain tile, veneer plaster, or other applied hard finishes.
      2) All interior gypsum drywall partitions to receive an applied veneer finish such as ceramic or porcelain tile shall be framed of minimum 20 gage, 3-5/8 inch deep, 33 mils thick (0.0329 inch) cold-formed metal studs. Heavier gage studs, if required to meet deflection requirements, are specified in Section 05 40 00.
2. Studs: “C” shaped with flat or formed webs, with knurled faces, and minimum 1.625-inch flanges with flange return lips.
   a. Provide 20 gage or heavier studs at all locations. Do not use any 22 or 25 gage studs.
      1) Studs heavier than 20 gage are specified in Section 05 40 00.
5. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
C. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 40 00.
D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems of fire rating and movement required.
   4. Deflection and Firestop Track:
      a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
   5. Products:
   6. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.

2.03 BOARD MATERIALS
A. Manufacturers - Gypsum-Based Board:
B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
      a. Exceptions:
         1) Glass-mat-faced gypsum panels shall be used at interior faces of exterior walls, except where coated glass-mat-faced gypsum backing board is required beneath tile finishes.
2) Coated glass-mat-faced gypsum backing board is required beneath tile finishes. It is also required beneath painted finishes of walls and ceilings at custodial, bathroom, locker, and shower areas.

3) Glass-mat-faced gypsum panels shall be used whenever gypsum wallboard is being installed before the building is enclosed. Being "enclosed" means that the roofing, exterior walls, windows, and exterior doors are in-place and sealed.

2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.

3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.

4. Thickness:
   b. Ceilings: 1/2 inch.
   c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

5. Paper-Faced Products:
   a. Certainteed; Product "Type X Gypsum Panels."
   b. Georgia-Pacific Gypsum; Product "ToughRock Fireguard X Gypsum Panels."

C. Glass-Mat-Faced Gypsum Wallboard: Glass-mat-faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish.

1. Application:
   a. Glass-mat-faced gypsum panels shall be used at interior faces of exterior walls, except where coated glass-mat-faced gypsum backing board is required beneath tile finishes.
   b. Glass-mat-faced gypsum wallboard shall be used whenever gypsum wallboard is being installed before the building is enclosed.
   c. At Contractor's option, glass-mat-faced gypsum panels may also be used at interior walls and ceilings, except where coated glass-mat-faced gypsum backing board is required.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.

4. Thickness:

5. Glass-Mat-Faced Gypsum Panel Products:
   a. Georgia-Pacific Gypsum; Product "DensArmor Plus."
   b. National Gypsum Company; Product "Gold Bond eXP Interior Extreme."
   c. USG Corporation; Product "Sheetrock Brand Glass-Mat Panels Mold Tough."

D. Coated Glass-Mat-Faced Gypsum Backing Board For Wet Areas:

1. Application:
   a. Wall surfaces scheduled to receive tile base or wall tile.
   b. Walls and ceilings at custodial, bathroom, locker, and shower areas to be painted.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

3. Glass-Mat-Faced Board: Coated glass-mat water-resistant gypsum backing panel as defined in ASTM C 1178.
   a. Thickness:
      1) Walls: 5/8 inch.
      2) Ceilings: 1/2 inch
   b. Products:
      1) Georgia-Pacific Gypsum; Product "DensShield Tile Backer."
      2) National Gypsum Company; Product "Gold Bond eXP Tile Backer."
      3) USG; Product "Durock Brand Glass-Mat Tile Backer Board."

E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Ceilings, unless otherwise indicated.
a. Exception: Coated glass-mat-faced gypsum backing board is required at ceilings of bathroom, locker, and shower areas.
2. Thickness: 1/2 inch.
4. Products:
   a. Georgia-Pacific Gypsum; ToughRock Span 24 Lite-Weight Ceiling Board.
F. Exterior Sheathing Board: As specified in Section 05 40 00.

2.04 ACCESSORIES
A. Acoustic Insulation: ASTM C665; preformed glass or mineral fiber, friction fit type, unfaced.
   1. Thickness: 3-5/8 inch, unless otherwise required to completely fill stud cavity.
B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
   1. Products: Equivalent to the following:
C. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated, with either knurled and perforated or expanded flanges, and beaded for concealment of flanges in joint compound.
   1. Types: Provide corner beads, L-type edge-trim beads, LC-type edge-trim beads, and one-piece control joint beads.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
   3. Products:
      a. Same manufacturer as framing materials.
D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, for use on glass-mat-faced substrates.
   2. Tape: 2 inch wide, creased paper tape for joints and corners, for use on paper-faced substrates.
   4. Chemical hardening type joint compound, for use on glass-mat-faced substrates.
E. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.
H. Anchorage to Substrate: Tie wire, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION
A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
B. Suspended Ceilings and Soffits: Space framing and furring members at 16 inches on center.
   1. Level ceiling systems to a tolerance of 1/600.
   2. Laterally brace entire suspension system.
   3. Install bracing as required at exterior locations to resist wind uplift.
C. Studs:  Space studs at 16 inches on center.
   1. Extend partition framing to structure where indicated and to 6 inches above ceiling at other
       locations.
   2. Partitions Terminating at Structure:  Attach top runner to structure, maintain clearance
       between top of studs and structure, and connect studs to track using specified mechanical
       devices in accordance with manufacturer's instructions; verify free movement of top of stud
       connections; do not leave studs unattached to track.

D. Openings:  Reinforce openings as required for weight of doors or operable panels, using not
   less than double studs at jambs.

E. Standard Wall Furring:  Install at concrete and masonry walls scheduled to receive gypsum
   board, not more than 4 inches from floor and ceiling lines and abutting walls.  Secure in place
   on alternate channel flanges at maximum 24 inches on center.
   2. Spacing:  At 16 inches on center.

F. Furring for Fire Ratings:  Install as required for fire resistance ratings indicated and to GA-600
   requirements.

G. Blocking:  Install wood blocking as specified in Section 06 10 00 for support of:
   1. Framed openings.
   2. Wall mounted cabinets.
   3. Plumbing fixtures.
   4. Toilet partitions.
   5. Toilet accessories.
   6. Wall mounted door hardware.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation:  Place tightly within spaces, around cut openings, behind and around
   electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant:  Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing
      members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where
      firestopping is provided.

3.04 BOARD AND GLASS-MAT-FACED BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions.  Install to minimize butt end
   joints, especially in highly visible locations.

B. Single-Layer Non-Rated:  Install gypsum board or glass-mat-faced gypsum board, as required,
   in most economical direction, with ends and edges occurring over firm bearing.

C. Double-Layer Non-Rated:  Use gypsum board for first layer, placed parallel to framing or furring
   members, with ends and edges occurring over firm bearing.  Use glass mat faced gypsum
   board at exterior walls and at other locations as indicated.  Place second layer perpendicular to
   framing or furring members.  Offset joints of second layer from joints of first layer.

D. Fire-Rated Construction:  Install gypsum board in strict compliance with requirements of
   assembly listing.

E. Glass-Mat-Faced Gypsum Board:  Use glass-mat-faced gypsum board at exterior walls and at
   other locations as indicated.

F. Glass-Mat-Faced Gypsum Board:  Use glass-mat-faced gypsum board at locations where board
   is being installed before the building is enclosed.

G. Coated Glass-Mat-Faced Gypsum Board:  Use coated glass-mat-faced gypsum board at walls
   and ceilings of custodial areas, bathrooms, lockers, showers, and at other locations as
   indicated.
H. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
I. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints at locations indicated, or if not indicated, consistent with lines of building spaces and as follows:
   1. Not more than 30 feet apart on walls over 50 feet long.
B. Corner Beads: Install at external corners, using longest practical lengths.
C. Edge Trim: Install at locations where edge of gypsum board would otherwise be exposed or semi-exposed. Provide type with face flange to receive joint compound.
   1. Install "L" bead where work is tightly abutted to other construction.
   2. Install "LC" bead where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).
   3. Semi-finishing edge trim will not be allowed.

3.06 JOINT TREATMENT

A. Glass-Mat-Faced Gypsum Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 2: Behind cabinetry, and on backing board to receive tile finish.
   4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.
   2. Taping, filling, and sanding is not required at surfaces behind fixed cabinetry.
   3. Taping, filling and sanding is not required at base layer of double layer applications.
E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION
SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Tile for floor applications.
   B. Tile for wall base applications.
   C. Tile for wall applications.
   D. Stone thresholds.
   E. Ceramic trim.
   F. Non-ceramic trim.

1.02 RELATED REQUIREMENTS
   A. Section 05 40 00 - Cold-Formed Metal Framing: Heavy gage studs, if required, for gypsum drywall partitions to receive applied porcelain tile finishes.
   B. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
   C. Section 09 21 16 - Gypsum Board Assemblies: Installation of lightgage metal framing; installation of coated glass-mat-faced gypsum backing board as wall tile substrate.

1.03 REFERENCE STANDARDS
   E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).


1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C1028:

   1. Level Surfaces: Minimum 0.6.

1.06 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.

B. Product Data: Provide manufacturers’ data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, setting details, and non-ceramic trim.

D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.

E. Manufacturer’s Certificate: Certify that products meet or exceed specified requirements.

F. Master Grade Certificate: Submit for each type of tile, signed by the tile manufacturer and tile installer.

G. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

1.07 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

C. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.
1.09 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

A. Products: Basis of Specification is Dal-Tile Corporation and Crossville Ceramics products indicated on the drawings. If other products are required, they will be listed on the drawings.


B. Porcelain Tile for Floors, Base and Walls: ANSI A137.1, standard grade.

1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
2. Size, Thickness and Shape: As indicated on drawings.
3. Colors: As scheduled.
4. Trim Units: Matching bullnose shapes in sizes indicated.
5. Products/Manufacturers: As indicated on drawings.

2.02 TRIM AND ACCESSORIES

A. Trim: Matching bullnose ceramic shapes in sizes indicated.

1. Applications:
   a. Open Edges: Bullnose.
   b. Inside Corners: Jointed.
   c. Floor to Wall Joints: Straight base.
2. Manufacturers: Same as for tile.

B. Non-Ceramic Trim: Brushed stainless steel, style and dimensions as indicated on drawings, for setting using tile mortar or adhesive.

1. Applications:
   a. Open edges of floor tile.
   b. Transition between floor finishes of different heights.
   c. Expansion and control joints, floor and wall.
   d. Borders and other trim as indicated on drawings.
2. Manufacturers:

2.03 SETTING MATERIALS

A. Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.

1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.
2. Products:
   c. Merkrete, by Parex USA, Inc; Merkrete 735 Premium Flex: www.merkrete.com/sle.

B. Premium, Large and Heavy Tile (LHT) Mortar Enriched with Polymer: ANSI A118.4TE.

1. Applications:
   a. Use this type of mortar for setting large or heavy tiles in floor and wall applications.
      1) Large Tiles: Tiles with at least one side greater than 15 inches long.
      2) Heavy Tiles: Tiles that are 5 lbs/sf or heavier.
2. Products:

2.04 GROUTS
A. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
3. Color(s): As scheduled.
4. Products:

2.05 EPOXY MORTAR AND GROUT MATERIALS
A. Epoxy Mortar and Grout: ANSI A118.3 chemical-resistant and water-cleanable epoxy mortar and grout.
1. Applications: Where indicated.
2. Color(s): As shown on the drawings.
3. Products:
   e. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/sle.
   f. ProSpec, an Oldcastle brand; B-7000 Epoxy Mortar and Grout: www.prospec.com.

2.06 ACCESSORY MATERIALS
A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
1. Type: Fluid-applied.
2. Thickness: As required by manufacturer to achieve the following:
   a. Crack Resistance: No failure at 1/8 inch gap, minimum.
3. Products:
4. Accessories: Provide any primers, joint fillers, pre-treatment materials or other accessory materials recommended by the system manufacturer for jobsite conditions encountered.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
D. 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, setting materials manufacturer, or crack isolation membrane manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION
A. Protect surrounding work from damage.
B. Vacuum clean surfaces and damp clean.
C. Seal substrate surface cracks with filler.

3.03 INSTALLATION - GENERAL
A. Install crack isolation membrane in accordance with applicable requirements of ANSI standards, manufacturer's instructions, and TCNA (HB) recommendations.
B. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
C. Lay tile to patterns indicated. Do not interrupt tile pattern through openings.
D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
F. Form internal angles square and external angles square.
G. Install non-ceramic trim in accordance with manufacturer's instructions.
H. Install thresholds where indicated.
I. Sound tile after setting. Replace hollow sounding units.
J. Keep control and expansion joints free of mortar, grout, and adhesive.
K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
L. Grout tile joints unless otherwise indicated.
M. Movement Joints: At changes in plane and tile-to-tile control or expansion joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS
A. Over all interior concrete substrates, provide crack isolation membrane installed in accordance with manufacturer's recommendations and TCNA (HB) Method F125-Full.
   1. Turn crack isolation membrane up 4 inches at adjacent walls scheduled to receive tile wall base.
B. Where epoxy grout is indicated, install tile over crack isolation membrane in accordance with TCNA (HB) Method F131, using epoxy mortar and grout.
C. Where large or heavy tiles are indicated, install tile over crack isolation membrane in accordance with TCNA (HB) Method F122, using LHT mortar enriched with polymer bond coat and high-performance polymer-modified grout.
D. At all other locations, install tile over crack isolation membrane in accordance with TCNA (HB) Method F122, using latex-portland cement mortar bond coat and high-performance polymer-modified grout.
E. Coordinate sealing of movement joints with Section 07 92 00.

3.05 INSTALLATION - WALL TILE

A. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.
   1. Where epoxy grout is indicated, install tile with epoxy mortar and grout.
   2. Where large or heavy tiles are indicated, install tile with LHT mortar enriched with polymer bond coat and high-performance polymer-modified grout.
   3. At all other locations, install tile with latex-portland cement mortar bond coat and high-performance polymer-modified grout.
   4. Coordinate sealing of movement joints with Section 07 92 00.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

   END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Suspended metal grid ceiling system.
B. Acoustical units.

1.02 REFERENCE STANDARDS
D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.03 ADMINISTRATIVE REQUIREMENTS
A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data on suspension system components and acoustical units.
C. Samples: Submit two samples at least 4 x 8 inch in size illustrating material and finish of acoustical units.
D. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner, and perimeter molding.
E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 FIELD CONDITIONS
A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.06 PROJECT CONDITIONS
A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Install acoustical units after interior wet work is dry.

1.07 EXTRA MATERIALS
A. Provide 100 sq ft of each type of acoustical unit for Owner's use in maintenance of project.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS
A. Manufacturers:
B. Acoustical Units - General: ASTM E1264, Class A.
C. Acoustical Panels Type APC-1: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
   1. Location: For general use, except at Food Service areas; see Finish Schedule on drawings.
   2. Size: 24 by 48 inches.
   5. Light Reflectance: 81 percent, determined in accordance with ASTM E1264.
   6. NRC: 0.55, determined as specified in ASTM E1264.
   7. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
   8. Edge: Square.
  10. Surface Pattern: Perforated, small holes, fissured.
  11. Product: 562 "Fissured" by USG Interiors, Inc.
  12. Suspension System: Exposed grid, Type "Donn DX".

D. Acoustical Panels Type APC-3: Vinyl faced mineral fiber, ASTM E1264 Type X, with the following characteristics:
   1. Location: For use at Food Service areas; see Finish Schedule on drawings.
   2. Size: 24 x 48 inches.
   5. Light Reflectance: 79 percent, determined as specified in ASTM E1264.
   7. Edge: Square.
  10. Product: 56091 "Clean Room ClimaPlus" by USG Interiors, Inc.
  11. Suspension System: Exposed grid, Type "Donn DXLA".

2.02 SUSPENSION SYSTEM(S)

A. Manufacturers:

B. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

C. Exposed Suspension System: Formed hot-dipped galvanized steel, commercial quality cold rolled; intermediate-duty.
   1. Profile: Tee; 15/16 inch wide face.
   2. Construction: Double web.
   4. Product:
      a. Hot Dip Galvanized Steel Cap: "Donn DX" manufactured by USG Interiors, Inc.
         1) Location: For general use, except at Food Service areas; see Finish Schedule on drawings.
      b. Aluminum Cap: "Donn DXLA" manufactured by USG Interiors, Inc.
         1) Location: For use at Food Service areas; see Finish Schedule on drawings.

2.03 ACCESSORIES

A. Support Channels and Hangers: Hot-dipped Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.
1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

C. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Install in bed of acoustical sealant.
   2. Use longest practical lengths.
   3. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

G. Where round obstructions and bullnose concrete block corners occur, provide preformed closures to match perimeter molding.

H. Install hold-down clips on panels within 10 ft of an exterior door.
3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION
SECTION 09 54 23
LINEAR METAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Metal ceiling suspension system and perimeter trim.
   B. Linear, formed metal soffit panels.

1.02 RELATED REQUIREMENTS
   A. Section 05 40 00 - Cold-Formed Metal Framing.
   B. Section 26 50 00 - Lighting Materials and Methods.

1.03 REFERENCE STANDARDS
   A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.04 DESIGN REQUIREMENTS
   A. Design components to ensure light fixtures and installed accessories will not induce eccentric loads. Where components may induce rotation of ceiling system components, provide stabilizing reinforcement.

1.05 ADMINISTRATIVE REQUIREMENTS
   A. Coordination: Coordinate work of this section with installation of mechanical and electrical components and with other construction activities affected by work of this section.
   B. Preinstallation Meeting: Convene one week before starting work of this section.

1.06 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Furnish for component profiles, materials, perimeter and integral trim, and space closures.
   C. Shop Drawings: Indicate reflected ceiling plan, location of mechanical and electrical components, details of junction with dissimilar materials, and points of suspension.
   D. Samples: Submit two samples minimum 12 by 12 inch in size illustrating color and finish of exposed to view components.

1.07 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
   B. Installer Qualifications: Company specializing in performing the work of this section.
   C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc.
1.08 DELIVERY, STORAGE, AND HANDLING

A. Accept factory-finished products on site in manufacturer's unopened factory packaging only; reject opened packages.

B. Protect factory-finished products from damage to appearance by storing products in manufacturer's unopened factory packaging in dry storage area.

1.09 WARRANTY

A. Provide five year manufacturer warranty; include coverage for corrosion resistance and discoloration of surface finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Linear Metal Ceilings:

2.02 LINEAR METAL CEILING

A. Linear Metal Soffit System: Panels, suspension members, trim and accessories as required to provide a complete system.
   1. Basis of Design: 6" "PlanarMacro MacroPlus" Square Edge-Matching Integral Filler Linear Metal Ceiling, manufactured by Rockfon, LLC.
      a. Panel Surface: Perforated, Pattern T, with acoustical backer.

B. Performance Requirements:
   1. Design to support imposed loads of indicated items without eccentric loading of supports.
   2. Design for maximum deflection of 1/360 of span.
   3. Design to resist seismic load required by applicable code.
   4. Noise Reduction Coefficient (NRC) at Perforated Panels: 0.70, measured in accordance with ASTM C423 with insulation installed.
   5. Systems Located Outside Building Envelope:
      a. Accommodate wind and suction loads and wind uplift without damage in accordance with applicable code.

2.03 COMPONENTS

A. Linear Panels:
   1. Material: Aluminum sheet, ASTM B209 (ASTM B209M), 0.032 inch thick.
      a. Surface: Perforated.
   2. Profile: Channel shape, 7/8 by 5-1/4 inch.
   3. Edge: Square, with integral filler strip.
   4. Sight-exposed Surface Finish: Enamel finish; of custom color as selected by Architect.

B. Edge Molding and Splices: Same material, thickness, and finish as linear panels.

C. End Caps: Formed metal; same color and finish as sight-exposed surfaces of linear panels.

D. Accessories: Stabilizer bars, clips, and hold down clips as required for suspended grid system; sight-exposed surfaces same color and finish as sight-exposed surfaces of linear panels.

E. Suspension Members: Formed aluminum sections, with integral attachment points; black polyester enamel finish; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

F. Subgirt Members: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating; formed to resist imposed loads and to provide attachment for linear panels and accessories.

G. Acoustical Material: "Soundtex" acoustical non-woven fiber factory adhered to back of perforated panels.
H. Touch-up Paint For Concealed Items: Zinc rich type.

2.04 FABRICATION
A. Shop cut linear panels to accommodate mechanical and electrical items.
B. Factory-form internal and external corners of same material, thickness, finish, and profile to match exposed linear panels; back brace internal corners.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that layout of hangers will not interfere with other work.
C. Verify that required utilities are available, in proper location, and ready for use.
D. Verify that field measurements are as indicated.

3.02 INSTALLATION
A. Suspension Components:
   1. Install after above-ceiling work is complete in accordance with manufacturer's instructions, ASTM C636/C636M, and ASTM E580/E580M.
   2. Hang carrying members independent of walls, columns, ducts, light fixtures, pipe, and conduit; where carrying members are spliced, avoid visible displacement of face panels with adjacent panels.
   3. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest adjacent hangers to span the required distance.
   4. Locate suspension system for linear panel layout parallel to building lines according to reflected plan.
B. Linear Panels:
   1. Install linear panels and other system components in accordance with manufacturer's instructions.
   2. Stagger end joints minimum 12 inches.
   3. Set exterior end joints with 1/16 inch gap for expansion and contraction.
   4. Provide expansion joints to accommodate plus or minus 1 inch movement and maintain visual closure.
   5. Install prefabricated corner sections at changes in panel direction.
   6. Install edge moldings at junctions with other finishes and at vertical surfaces; use maximum piece lengths.
   7. Where bullnose masonry units occur, install radiused closures to fit edge molding.
   8. Install end caps at sight-exposed ends of linear panels.
   9. Exercise care when site cutting sight-exposed finished components to ensure surface finish is not defaced.

3.03 TOLERANCES
A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.
C. Maximum Variation From Dimensioned Position: 1/4 inch.

3.04 CLEANING
A. Clean exposed surfaces.
B. Replace damaged or abraded components.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Resilient tile flooring.
   B. Resilient base.
   C. Installation accessories.

1.02 RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS
   B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
   G. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
   C. Selection Samples: Submit manufacturer's complete set of color samples for Contracting Officer's Representative's initial selection.
   D. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.
   E. Concrete Testing Standard: Submit a copy of ASTM F710.
   F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
   G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
   B. Store all materials off of the floor in an acclimatized, weather-tight space.
   C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
   D. Do not double stack pallets.
1.06 FIELD CONDITIONS
   A. Store materials for not less than 48 hours prior to installation in area of installation at a
temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions
above 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING
   A. Vinyl Composition Tile (VCT): Homogeneous, with color extending throughout thickness.
   1. Manufacturers:
      a. Basis of Design: Armstrong World Industries, Inc; Standard Excelon Imperial
   2. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type
      specified.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in
      accordance with ASTM E 648 or NFPA 253.
   4. Size: 12 by 12 inch.
   5. Thickness: 0.125 inch.
   6. Colors: As shown on drawings.
   B. Vinyl Tile (Vinyl Plank Flooring): Printed film type, with transparent or translucent wear layer,
and:
   1. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type
      specified.
   2. Colors: As indicated.
   3. Product/Manufacturer: As indicated on drawings.

2.02 RESILIENT BASE
   A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Manufacturers:
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in
      accordance with ASTM E 648 or NFPA 253.
   3. Height: As indicated.
   4. Thickness: 0.125 inch thick.
   5. Finish: Satin.
   7. Colors: As scheduled.
   8. Accessories: Premolded external corners, internal corners, and end stops.

2.03 ACCESSORIES
   A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
   B. Primers and Adhesives: Waterproof; low-VOC types recommended by flooring manufacturer.
   C. Moldings, Transition and Edge Strips: Same material as flooring.
   D. Filler for Coved Base: Plastic.
   E. Floor Treatment Materials:
      2. Floor Finish: Signature High Performance UHS Finish, by SC Johnson Wax Professional.
PART 3  EXECUTION

3.01  EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Test in accordance with ASTM F710.
   2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

D. Verify that required floor-mounted utilities are in correct location.

3.02  PREPARATION

A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

C. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

D. Prohibit traffic until filler is fully cured.

E. Clean substrate.

F. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03  INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Fit joints and butt seams tightly.

E. Set flooring in place, press with heavy roller to attain full adhesion.

F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   1. Resilient Strips: Attach to substrate using adhesive.

H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

I. Install flooring in recessed floor access covers, maintaining floor pattern.

J. At movable partitions, install flooring under partitions without interrupting floor pattern.

K. Install feature strips where indicated.

3.04  TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

C. Install tile in patterns indicated. Allow minimum 1/2 full size tile width at room or area perimeter.
3.05 RESILIENT BASE
   A.  Fit joints tightly and make vertical.  Maintain minimum dimension of 18 inches between joints.
   B.  Miter internal corners.  At external corners, use premolded units.  At exposed ends, use premolded units.
   C.  Install base on solid backing.  Bond tightly to wall and floor surfaces.
   D.  Scribe and fit to door frames and other interruptions.

3.06 CLEANING
   A.  Remove excess adhesive from floor, base, and wall surfaces without damage.

3.07 FLOOR TREATMENT
   A.  Provide floor treatment for new resilient flooring.
   B.  Examine surfaces and adjacent areas where products will be applied and verify that surfaces conform to product manufacturer's requirements for substrate conditions. Do not proceed until satisfactory conditions have been corrected.
   C.  Stripping VCT:
      1.  Mix one part stripper to four parts water.
      2.  Apply solution liberally to a manageable area of the floor and let solution set for 10 minutes prior to scrubbing. Do not allow the stripper to dry. Re-wet as necessary.
      3.  Scrub VCT floor using an auto scrubber with maximum pad pressure or a slow speed buffer equipped with black pads or stripping brushes. Make at least three passes over each tile to remove mill finish.
      4.  Thoroughly rinse the floor to remove any residue of cleaning or stripper solution.
      5.  Let floor dry completely prior to application of floor finish.
   D.  Finishing:
      1.  Apply floor finish in accordance with manufacturer's instructions.
      2.  Vinyl Composition Flooring: Apply four coats of floor finish to floor. Burnish floor after 24 hours after final application and again prior to store opening.
      3.  Allow a minimum of 45 minutes drying time between coats.
      4.  HVAC shall be in operation during drying and curing of floor finish.

3.08 PROTECTION
   A.  Prohibit traffic on resilient flooring for 48 hours after installation.
   B.  Maintain adhesive manufacturer’s specified temperature range until completion of construction operations.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Carpet tile, fully adhered.

1.02 RELATED REQUIREMENTS
   A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS
   B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

1.04 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
   C. Shop Drawings: Indicate location of edge moldings and transition details to other flooring materials.
   D. Samples: Submit two full-size carpet tiles illustrating color and pattern design for each carpet color selected.
   E. Submit two, 12 inch long samples of exposed edge, transition, and other accessory stripping.
   F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
   G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
   H. Maintenance Materials: Furnish the following for Owner’s use in maintenance of project.
      1. See Section 01 60 00 - Product Requirements, for additional provisions.
      2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed, but not less than 10 sq. yd.

1.05 QUALITY ASSURANCE
   A. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS
   A. Store materials in area of installation for minimum period of 24 hours prior to installation.

1.07 WARRANTY
   A. Special Warranty for Carpet Tiles: Manufacturer’s standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
      1. Limited Lifetime Modular Warranty.
      2. Lifetime Static.

PART 2 PRODUCTS

2.01 CARPET TILE
1. Colors: As indicated.

2.02 MATERIALS
A. Tile Carpeting: Textured patterned loop, manufactured in one color dye lot.
   1. Tile Size: 18 by 18 inch, nominal.
   2. Nylon Fiber Type: Ultron Nylon BCF.
   4. Face Weight: 35 oz/sq yd.
   5. Pile Height Average: 0.150 inch.
   7. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
   8. Maximum Electrostatic Charge: 3 Kv. at 20 percent relative humidity.
   10. Stitches: 11.00 stitches/inch.

2.03 ACCESSORIES
A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
B. Edge Strips: Vinyl, color as indicated or as selected by Contracting Officer.
C. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
   1. VOC Limits: Provide adhesives with VOC content not exceeding 50 g/L.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
C. Cementitious Subfloor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Test in accordance with ASTM F710.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION
A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.
C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
D. Vacuum clean substrate.

3.03 INSTALLATION
A. Starting installation constitutes acceptance of subfloor conditions.
B. Install carpet tile in accordance with manufacturer's instructions and CRI (CIS).
C. Blend carpet from different cartons to ensure minimal variation in color match.
D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
E. Lay carpet tile in pattern as shown on drawings, parallel to walls and borders.
F. Locate change of color or pattern between rooms under door centerline.
G. Fully adhere carpet tile to substrate.
H. Trim carpet tile neatly at walls and around interruptions.
I. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING
A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
B. Clean and vacuum carpet surfaces.

END OF SECTION
SECTION 09 77 33  
GLASS FIBER REINFORCED PLASTIC PANELS  

PART 1 GENERAL  

1.01 SECTION INCLUDES  
A. Glass fiber reinforced plastic panels.  
B. Trim.  

1.02 REFERENCE STANDARDS  
F. FDA Food Code - Chapter 6 - Physical Facilities; current edition with Supplements, if any.  
G. FM 4880 - Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall Systems; 2010.  

1.03 SUBMITTALS  
A. See Section 01 33 00 - Submittals, for submittal procedures.  
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.  
C. Samples: Submit two samples 6 x 6 inch in size illustrating material and surface design of panels.  

1.04 DELIVERY, STORAGE, AND HANDLING  
A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.  

PART 2 PRODUCTS  

2.01 MANUFACTURERS  
A. Glass Fiber Reinforced Plastic Panels: Equivalent to the following:  

2.02 PANEL SYSTEMS  
A. Wall Panels:  
   1. Panel Size: 4 by 10 feet.  
   4. Color: P 100 White Class A.  
   5. Attachment Method: Adhesive only, with trim and sealant in joints.  

2.03 MATERIALS  
A. Panels: Glass fiber reinforced plastic (FRP), complying with ASTM D5319.  
   1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.  
   2. Class 1 fire rated when tested in accordance with FM 4880.  
   3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
4. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.
5. Impact Strength: Greater than 7.0 ft lb force per inch, when tested in accordance with ASTM D256.
6. Surface Characteristics and Cleanability: Provide products that are smooth, durable, and easily cleanable, in compliance with FDA Food Code, Chapter 6 - Physical Facilities.

B. Trim: Vinyl; color coordinating with panel.
C. Adhesive: Type recommended by panel manufacturer.
D. Sealant: Silicone; white.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions and substrate flatness before starting work.
B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS
A. Install panels in accordance with manufacturer's instructions.
B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.
C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.
D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.
E. Install panels with manufacturer’s recommended gap for panel field and corner joints.
F. Place trim on panel before fastening edges, as required.
G. Fill channels in trim with sealant before attaching to panel.
H. Install trim with adhesive.
I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.
J. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION
SECTION 09 90 00
PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.
   3. Prime surfaces to receive wall coverings.
   4. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, tene, and lead items.
   7. Marble, granite, slate, and other natural stones.
   8. Floors, unless specifically so indicated.
   9. Ceramic and other tiles.
   11. Glass.
   12. Acoustical materials, unless specifically so indicated.
   13. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

B. Section 08 11 13 - Hollow Metal Doors and Frames: Shop-primed items.

C. Section 08 39 53 - Blast Resistant Steel Door and Frame Assemblies: Shop-primed items.

1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS


D. GreenSeal GS-11 - Paints and Coatings; 2013.
1.05 SUBMITTALS

A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide data on all finishing products, including VOC content.
C. Samples: Submit two paper chip samples illustrating range of colors available for each surface finishing product scheduled.
D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
F. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.
G. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
C. Paints and Transparent Finishes:
D. Primer Sealers: Same manufacturer as top coats.
E. Block Fillers: Same manufacturer as top coats.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.

4. Supply each coating material in quantity required to complete entire project's work from a single production run.

5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
         1) Opaque, Flat: 50 g/L, maximum.
         2) Opaque, Nonflat: 150 g/L, maximum.
         3) Opaque, High Gloss: 250 g/L, maximum.
         4) Varnishes: 350 g/L, maximum.
      b. Architectural coatings VOC limits of the State in which the Project is located.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Chemical Content: The following compounds are prohibited:
   1. Intentionally added methylene chloride or perchloroethylene.
   2. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   3. Acrolein, acrylonitrile, anthimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

E. Flammability: Comply with applicable code for surface burning characteristics.

F. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Contracting Officer's Representative from the manufacturer's full line.

G. Colors: As indicated on drawings
   1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
   2. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

2.03 PAINT SYSTEMS - EXTERIOR

A. Ferrous, Galvanized, and Aluminum Metals: Opaque, 100% Acrylic:
      a. Touch-up shop primer with rust-inhibitive primer recommended by top coat manufacturer.
   2. Semi-Gloss: Two coats of S-W "Sher-Cryl HPA (B66-350), applied to achieve a dry-film thickness (DFT) of 2.5 - 4.0 mils per coat.
2.04 PAINT SYSTEMS - INTERIOR

A. Wood, Opaque, Acrylic Latex:
   1. Primer: One coat of S-W Premium Wall & Wood Primer (B28W8111).

B. Wood, Transparent, Varnish, Stain:
   1. Filler coat (for open grained wood only) of S-W "Sher-Wood" Natural Filler.
   2. One coat of stain; S-W "Wood Classics" Interior Oil Stain.
   3. One coat of varnish; S-W "Wood Classics" Waterborne Polyurethane Varnish, Gloss.
   4. One coat of varnish; S-W "Wood Classics" Waterborne Polyurethane Varnish, Satin.

C. Concrete/Masonry, Opaque, Latex, 3 Coat:
   1. One coat of block filler; S-W PrepRite Block Filler (B25W25). Provide additional coats as necessary to fill all voids in concrete masonry surfaces.

D. Ferrous Metals, Primed, and Galvanized Metals, Opaque, Acrylic Latex:

E. Aluminum, Unprimed, Opaque, Acrylic Latex:

F. Exposed Metal Decking, Bar Joists, Purlins, Steel Roof Framing & Galvanized Ductwork:
   Opaque, Acrylic Dryfall:
   1. Primer: S-W "Pro Industrial Pro-Cryl" Universal Metal Primer, B66-310 Series, or other primer recommended by manufacturer for specific conditions.
      a. Touch-up shop primer with rust-inhibitive primer recommended by top coat manufacturer.
   2. Flat: One coat of S-W "Pro Industrial Waterborne Acrylic Dryfall," B42 Series, applied to achieve a dry-film thickness (DFT) of 3.0 mils per coat.

G. Gypsum Board/Glass Mat Faced Gypsum Board/Plaster, Opaque, Acrylic Latex:
   1. Primer: One coat of S-W "Pro-Mar 200" Zero VOC Interior Latex Primer (B28-2600).
   2. Eggshell: Two coats of S-W "Pro-Mar 200" Zero VOC Interior Latex Eggshell (B20-2600).
      a. Locations: All walls and ceilings, except as otherwise indicated.
      a. Locations: Walls and ceilings at Toilet Rooms, IDF Rooms, Tech Closets, Electrical Rooms.

H. Fire-Retardant Coating, Intumescent:
   1. One coat of fire-retardant primer sealer.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
D. If substrate preparation is the responsibility of another installer, notify Contracting Officer's Representative of unsatisfactory preparation before proceeding.

E. Test shop-applied primer for compatibility with subsequent cover materials.

F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing coatings that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
   1. Where existing paper or vinyl wallcoverings are encountered on walls to be painted, remove wallcovering and skim coat wall to achieve a Level 5 finish prior to painting.

I. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.

J. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

K. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

L. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

M. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

N. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

O. Metal Doors to be Painted: Prime and paint metal door top and bottom edge surfaces to match face of door.
3.03 APPLICATION
A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
B. Apply products in accordance with manufacturer’s instructions.
C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
E. Apply each coat to uniform appearance.
F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
G. Number of coats indicated is the minimum number of coats to be provided. Full coverage is required for each coat. Provide additional coats as necessary to provide full coverage or dry film thicknesses indicated.
H. Sand wood and metal surfaces lightly between coats to achieve required finish.
I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
J. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT
A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
B. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.05 MARKING AND IDENTIFICATION OF FIRE WALLS
A. Where there is an accessible concealed floor, floor-ceiling or attic space, fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling in the concealed space. Such identification shall:
   1. Be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet measured horizontally along the wall or partition.
   2. Include lettering not less than 3 inches in height with a minimum 3/8-inch stroke in a contrasting color incorporating the suggested wording, “FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS,” or similar wording.

3.06 CLEANING
A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 PROTECTION
A. Protect finished coatings until completion of project.
B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION
SECTION 10 14 00
SIGNAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. ADA Room Identification Signage (Panel signs).

1.02 RELATED REQUIREMENTS
A. Section 01 50 00 - Temporary Facilities and Controls: Temporary project identification signs.
B. Division 23 Sections: Labels, tags, and nameplates for mechanical equipment.
C. Division 26 Sections: Labels, tags, and nameplates for electrical equipment; illuminated exit signs. Electrical service and connections.

1.03 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product data from each manufacturer for each type of product specified, including construction details relative to materials, dimensions of individual components, profiles, finishes and accessories for each type of sign and dimensional letter and number required.
C. Shop Drawings: Provide shop drawings for fabrication and erection of signs. Include elevations and large-scale sections of typical members and other components. Show anchors, grounds, reinforcement, accessories, layout, and installation details. Provide text for each sign required, including large scale details of wording and layout of lettering.
D. Panel sign samples: Provide one full size sample of each type of sign specified for initial selection of color, pattern and surface texture required. On each panel include a representative example of the graphic image process required, showing graphic style, colors and finishes of letters, numbers and other graphic devices as required and for verification of compliance with requirements indicated.
E. Dimensional letters and number samples: Provide full-size representative sample of each dimensional letter type required, showing letter style, color, and material finish and method of attachment, as required and for verification of compliance with requirements indicated.

1.04 QUALITY ASSURANCE
A. Single-Source Responsibility: For each separate type of sign required, obtain signs from one source from a single manufacturer.
B. Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
A. Signs: Specifications are based on Interface Architectural Signage. Subject to compliance with requirements and properties of the products specified, products by the following manufacturers will be considered:
   1. ANDCO Industries Corp.
   2. Best Manufacturing Company.
   3. Charleston Industries, Inc.
   4. DGS Corp.
   5. Diskey Sign Corp.
   8. Modulex.
   10. Poblocki & Sons, Inc.
11. Spanjer Brothers, Inc.
12. The Supersine Company.
13. Vomar Products, Inc.

2.02 UNFRAMED PANEL SIGNS
A. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
1. Produce smooth, even level sign panel surfaces, constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally.
2. Text shall be centered at top of signs, with symbol centered.
3. Braille shall be produced by extracting the background of the plaque using a photo etching process, leaving the copy and braille raised. The plaque shall then be laminated to an opaque acrylic base, cut to size and finished with a professional surface painted acrylic polyurethane enamel in a specified color. The photo etched plaque shall have raised Grade 2 Braille, meeting both ADA and ANSI guidelines.

2.03 FABRICATION
A. Signs: Plaque face; 1/32" raised copy, integral copy/Braille, 1/8" thick opaque acrylic base. Comply with ADA.
1. Raised Copy: Produced by photo mechanical etching process.
2. Plaque background color to be Interface #5 Slate.
3. Plaque face shall be laminated to 1/8" thick opaque acrylic base.
4. Text, logos, and border design, precision cut, 1/32" minimum thickness, black or white, polyurethane enamel finish, upper case. Helvetica medium style, shall be chemically welded to the face of the plaque.
5. Edge Condition: Beveled.

2.04 SIGN TYPES
A. ADA, text, Braille text and symbol as indicated, 8-3/4" x 8-3/4", plaque.
1. Men/Women with universal symbols and universal accessibility symbol.
2. “Keep This Door Unlocked During Business Hours”.
3. Maximum Occupancy: _______.
4. Door and room signs with copy as indicated on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION
A. General: Locate signs and dimensional letter units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
1. Install signs and dimensional letters level, plumb, and at the height indicated and free from distortion or other defects in appearance, with sign surfaces free from distortion or other defects in appearance.

B. Wall Mounted Panel Signs: Attach panel signs to wall surfaces using double-sided foam tape to mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces. Use silastic adhesive for irregular of porous surfaces or where sign occurs on a vinyl covered surface.
1. Provide signs on wall adjacent to latch side of door, with Braille between 48" and 60" above finish floor unless otherwise noted.
   a. Mount sign so that a person may approach within 3" of sign without encountering protruding objects or standing within the swing of a door.
   b. Signs at exterior entrances shall be installed adjacent to the entrance as directed by EXCHANGE.

C. Dimensional letters: Installed with manufacturer's recommended spacing, align all letters with each other, level and plumb.
3.02 CLEANING AND PROTECTION
   A. After installation, clean soiled sign surfaces according to the manufacturer's instructions. Protect units from damage until acceptance by EXCHANGE.

   END OF SECTION
SECTION 10 21 13
TOILET COMPARTMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Toilet compartments and screens as follows:
   1. Type: Solid plastic.
   2. Compartment Style: Overhead braced and floor anchored.

1.02 RELATED REQUIREMENTS
A. Section 10 28 00 - Toilet and Bath Accessories: Toilet paper holders, grab bars, purse shelves, and similar accessories.

1.03 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: For each type and style of toilet compartment and screen specified. Include details of construction relative to materials, fabrication, and installation. Include details of anchors, hardware, and fastenings.
C. Shop Drawings: For fabrication and installation of toilet compartment and screen assemblies. Include plans, elevations, sections, details, and attachments to other work.
   1. Show locations of reinforcement and cutouts for compartment-mounted toilet accessories.
D. Samples for Verification: Of each compartment or screen color and finish required, prepared on 6-inch- (150-mm-) square Samples of same thickness and material indicated for Work.

1.04 PROJECT CONDITIONS
A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
A. Solid plastic toilet compartments and urinal screens: Subject to compliance with requirements. Basis of this specification is Scranton Products “Hiny Hiders” solid plastic partitions.
   1. Accurate Partitions Corporation.
   2. All American Metal Corp.
   3. Ampco Products, Inc.
   5. Capitol Partitions, Inc.
   6. Crane Plumbing; Sanymetal.
   8. Global Steel Products Corp.
   9. Metpar Corp.
   11. Scranton Products.

2.02 MATERIALS
A. General: Provide materials that have been selected for surface flatness and smoothness. Exposed surfaces that exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are unacceptable.
B. Pilaster Shoes and Sleeves (Caps): ASTM A 666, Type 302 or 304 stainless steel, not less than 0.0312 inch (0.8 mm) thick and 3 inches (75 mm) high, finished to match hardware.
C. Stirrup Brackets: Manufacturer’s standard ear or U-brackets for attaching panels and screens to walls and pilasters of the following material:
1. Material: Chrome-plated, nonferrous, cast zinc alloy (zamac) or clear-anodized aluminum.

D. Full-Height (Continuous) Brackets: Manufacturer's standard design for attaching panels and screens to walls and pilasters of the following material:

E. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories of the following material:
   1. Material: Chrome-plated, nonferrous, cast zinc alloy (zamac) or clear-anodized aluminum.

F. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile in manufacturer's standard finish.

G. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match hardware, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use hot-dip galvanized or other rust-resistant, protective-coated steel.

2.03 FABRICATION

A. General: Provide standard doors, panels, screens, and pilasters fabricated for compartment system. Provide units with cutouts and drilled holes to receive compartment-mounted hardware, accessories, and grab bars, as indicated.
   1. Provide internal reinforcement in metal units for compartment-mounted hardware, accessories, and grab bars, as indicated.

B. Toilet Compartments: Floor supported, headrail braced type solid plastic compartments of types and manufacturers as follows, or approved equal. Basis of Design is Scranton Products.
   1. Acurate Partitions Corporation “Floor Anchored/Overhead braced”.
   2. Global “Floor Anchored/Overhead braced”.
   3. Knickerbocker “Floor Anchored/Overhead braced”.
   4. Sanymetal “Floor Anchored/Overhead braced”.
   5. General Partitions Corporation “Floor Anchored/Overhead braced”.
   6. Flush-Metal Partitions “Floor Anchored/Overhead braced”.
   7. Scranton Products “Floor Anchored/Overhead Braced”.

C. Urinal Screens: Wall hung solid plastic, 18 inches by 42 inches, of types and manufacturers as follows, or approved equal. Basis of Design is Scranton Products.
   1. Acurate Partitions Corporation “Wall Hung”.
   2. Global “Wall Hung”.
   3. Knickerbocker “type WH”.
   4. Sanymetal “Type C”.
   5. General Partitions Corporation “WHF-3”.
   6. Flush-Metal Partitions “Type WH”.
   7. Scranton Products.

D. Concealed Anchorage Reinforcement: Minimum 12 gage galvanized steel sheet.

E. Overhead-Braced-and-Floor-Anchored Compartments: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit floor conditions. Make provisions for setting and securing continuous head rail at top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.

F. Wall-Hung Screens: Provide units in sizes indicated of same construction and finish as compartment panels, unless otherwise indicated.
   1. Provide solid plastic screens with integral full-height flanges for attachment to wall.

G. Doors: Unless otherwise indicated, provide 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments indicated to be handicapped accessible.
   1. Hinges: Manufacturer's standard self-closing type that can be adjusted to hold door open at any angle up to 90 degrees.
2. Latch and Keeper: Manufacturer's standard surface-mounted latch unit with combination rubber-faced door strike and keeper designed for emergency access. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be handicapped accessible.

3. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.

4. Door Bumper: Manufacturer's standard rubber-tipped bumpers at out-swinging doors or entrance screen doors.

5. Door Pull: Manufacturer's standard unit that complies with accessibility requirements of authorities having jurisdiction at out-swinging doors. Provide units on both sides of doors at compartments indicated to be handicapped accessible.

2.04 SPECIAL FEATURES

A. Reinforcing: Provide special reinforcing in core construction of panels scheduled to receive grab bars. Design reinforcement to support grab bars under a minimum 300 pound shear load at each connection point.

B. Provide stainless steel loop door pulls on each side of door to handicap stall and next adjacent stall if applicable. Doors to stalls with pulls to open outward.

2.05 TYPE AND COLOR:

A. See Finishes Legend.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, plumb, and level. Provide clearances of not more than 1/2 inch (13 mm) between pilasters and panels and not more than 1 inch (25 mm) between panels and walls. Secure units in position with manufacturer's recommended anchoring devices.

1. Secure panels to walls and panels with not less than 2 stirrup brackets attached near top and bottom of panel. Locate wall brackets so holes for wall anchors occur in masonry or tile joints. Align brackets at pilasters with brackets at walls.

B. Overhead-Braced-and-Floor-Anchored Compartments: Secure pilasters to floor and level, plumb, and tighten. Secure continuous head rail to each pilaster with not less than 2 fasteners. Hang doors and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

C. Screens: Attach with anchoring devices according to manufacturer's written instructions and to suit supporting structure. Set units level and plumb and to resist lateral impact.

3.02 EXCESS MATERIALS AND WASTE

A. Recycling: Separate and recycle all waste materials in accordance with the Contractor's waste management plan and to the extent economically feasible. This includes metal banding, pallets, and other shipping materials in addition to waste resulting from installation operations.

3.03 ADJUSTING AND CLEANING

A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and swing doors in entrance screens to return to fully closed position.

B. Provide final protection and maintain conditions that ensure toilet compartments and screens are without damage or deterioration at the time of Substantial Completion.

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Wall protection systems.
      1. Corner guards.
      2. Cart bumper rails.

1.02 RELATED REQUIREMENTS
   A. Section 06 10 00 - Rough Carpentry: Wood blocking and grounds for corner guards.
   B. Section 08 71 00 - Door Hardware: Stainless steel mop plates, kick plates, and armor plates.

1.03 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product data for each wall surface protection system component and installation accessory required, including installation methods for each type of substrate. Provide written data on each required component including physical characteristics, such as durability, resistance to fading, and flame resistance.

1.04 QUALITY ASSURANCE
   A. Installer Qualifications: Engage an experienced Installer who has previously installed wall surface protection systems similar in material, design, and extent to the systems indicated for this Project.
   B. Impact Strength: Provide wall surface protection system components with a minimum impact resistance of 16 ft. lbs per sq. ft. when tested in accordance with ASTM D 256 (Izod impact, ft. lbs per inch notch).
   C. Single Source Responsibility: Obtain each color, grade, finish, and type of wall surface protection system component from a single source with resources to provided products of consistent quality in appearance and physical properties without delaying progress of the Work.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Deliver materials to Project site in original factory wrappings and containers, clearly labeled with identification of manufacturer, brand name, quality or grade, and fire hazard classification.

1.06 MAINTENANCE
   A. Maintenance Instructions: Provide the manufacturer's instructions for maintenance of installed work. Include recommended methods and frequency for maintaining optimum condition under anticipated traffic and use conditions. Include precautions against cleaning materials and methods that may be detrimental to finishes and performance.
   B. Replacement Materials: After completion of work, deliver not less than 2 percent of each type, color, and pattern of wall surface protection materials and components. Include accessory components as required. Replacement materials shall be from the same production run as materials installed. Package replacement materials with protective covering, identified with appropriate labels.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
   A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. American Floor Products Co., Inc.
      2. Balco, Inc.
      4. Construction Specialties, Inc.
      5. K. J. Miller Corporation.
7. Pawling Corporation.
8. Tepromark International, Inc.
10. Tubular Specialties.
12. McCue Corporation.

2.02 MATERIALS
A. Polycarbonate Plastic Sheet: Abrasion-resistant, clear, transparent polycarbonate plastic sheet with an impact resistant rating of 16 ft. lb. per inch tested in accordance with ASTM D 256.
B. Fasteners for Corner Guards: Provide aluminum, nonmagnetic stainless steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with aluminum components, hardware, anchors, and other items being fastened. Use theft-proof fasteners where exposed to view.

2.03 CORNER GUARDS
A. Stainless-Steel Corner Guards: Paper-covered, satin-finish, 0.0625-inch (1.6-mm) minimum, stainless-steel sheet corner guards; height as indicated. Provide 90-degree turn, unless otherwise indicated; and formed edges. Stainless steel plate Type 304 minimum 0.625 inches thick.
   1. Provide corner guards in shapes, as noted below and as detailed on the drawings.
      a. Wing Size: 1-1/2 by 1-1/2 inches.
      c. Corner Radius: 1/8 inch (3.2 mm).
      d. Height: Provide corner guards on all outside corners to heights at the area locations specified below:
         1) MPA – to 8'-0" above finished floor.
         2) Food Court, Mall and other locations – to 10'-0" above finished floor.
B. Polycarbonate Corner Guards: Provide clear scratch resistant polycarbonate corner guards, height as indicated. Provide 90° turn, unless otherwise indicated.
   1. Size: 1-1/2" x 1-1/2".
   3. Corner Radius: 1/8".
   4. Height: 10'-0".
   5. Location: Retail and ODL: All outside corners, including columns.

2.04 CART BUMPER RAILS
      a. Provide all components, connectors, fittings and anchors necessary for a complete installation.

2.05 FABRICATION
A. General: Fabricate wall and door protection systems to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thicknesses of components.
B. Preassemble components in the shop to the greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
C. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of evidence of wrinkling, chipping, uneven coloration, dents, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.
D. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors for interconnection of members to other construction.
E. Provide inserts and other anchorage devices for connecting components to concrete or masonry. Fabricate anchoring devices to be capable of withstanding imposed loads. Coordinate anchoring devices with the supporting structure.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions in which wall surface protection components and wall protection systems will be installed.
   1. Complete all finishing operations, including painting, before beginning installation of wall surface protection system materials.

B. Do not proceed with installations until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. General: Prior to installation, clean substrate to remove dust, debris, and loose particles.

3.03 INSTALLATION

A. General: Install products in accordance with manufacturer's recommendations.

B. Install wall surface protection units plumb, level, and true to line without distortions.
   1. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished work.

3.04 CLEANING

A. General: Immediately upon completion of installation, clean plastic covers and accessories using a standard ammonia based household cleaning agent. Clean metal components in accordance with the manufacturer's recommendations.

B. Remove excess adhesive using methods and materials recommended by manufacturer.

C. Remove surplus materials, rubbish, and debris resulting from installation upon completion of work and leave areas of installation in neat, clean condition.

END OF SECTION
SECTION 10 28 00
TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Automatic paper towel dispenser.
   B. Grab bars.
   C. Sanitary disposal unit.
   D. Soap dispenser.
   E. Mirrors.
   F. Diaper changing station.
   G. Child protection seat.
   H. Toilet tissue dispensers.
   I. Folding and fixed shelves.
   J. Seat cover dispensers.
   K. Recessed trash receptacles.
   L. Robe hooks
   M. Mop and broom holder.
   N. Under sink pipe covers.

1.02 RELATED REQUIREMENTS
   A. Section 10 21 13 - Toilet Compartments.

1.03 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product data for each toilet accessory item specified, including construction details relative to materials, dimensions, gages, profiles, mounting method, specified options, and finishes.
   C. Schedule indicating types, quantities, sizes, and installation locations (by room) for each toilet accessory item to be provided for project.
   D. Setting drawings where cutouts are required in other work, including templates, substrate preparation instructions, and directions for preparing cutouts and installing anchorage devices.

1.04 QUALITY ASSURANCE
   A. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to the Contracting Officer.

1.05 PROJECT CONDITIONS
   A. Coordination: Coordinate accessory locations, installation, and sequencing with other work to avoid interference with and ensure proper installation, operation, adjustment, cleaning, and servicing of toilet accessory items.

1.06 WARRANTY
   A. Special Project Warranty: Submit a written warranty executed by mirror manufacturer, agreeing to replace any mirrors that develop visible silver spoilage defects within warranty period.
   B. Warranty Period: 5 years from date of Substantial Completion.
   C. The warranty shall not deprive EXCHANGE of other rights EXCHANGE may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide toilet accessories by one of
   the following:
   1. Bobrick Washroom Equipment, Inc.
   2. Bradley Corporation.

B. Verify with EXCHANGE Representative the exact items EXCHANGE will be furnishing for
   installation by the General Contractor.

2.02 MATERIALS, GENERAL

A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 0.034-inch (22-gage) minimum
   thickness.

B. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 0.04-inch (20-gage) minimum.
   Surface preparation and metal pretreatment as required for applied finish.

C. Galvanized Steel Sheet: ASTM A 527, G60.

D. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, Type
   SC 2.

E. Mirror Glass: Nominal 6.0-mm (0.23-inch) thick, conforming to ASTM C 1036, Type I, Class 1,
   Quality q2, and with silvering, electro-plated copper coating, and protective organic coating.


G. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of
   galvanized steel where concealed.

2.03 PAPER TOWEL DISPENSER (EF/CI)

A. Georgia Pacific #59462 EnMotion Wall Mount Automated Touchless Towel Dispenser.

2.04 GRAB BARS (CF/CI)

A. Stainless Steel Type: Provide grab bars with wall thickness not less than 0.05 inch (18 gage)
   and as follows:
   1. Mounting: Concealed, manufacturer's standard flanges and anchorages.
   2. Clearance: 1-1/2-inch clearance between wall surface and inside face of bar.
   4. Heavy-Duty Size: Outside diameter of 1-1/2 inches.

2.05 SANITARY NAPKIN DISPOSAL UNITS (CF/CI)

A. Bobrick #B-254 Surface Mount.

2.06 SOAP DISPENSERS (EF/CI)

A. Eco Lab Kay touch free dispenser.

2.07 MIRROR UNITS (CF/CI)

A. Standard Stainless Steel Framed Mirror Units: Fabricate frame with channel shapes not less
   than 0.04 inch (20 gage), with square corners carefully mitered to hairline joints and
   mechanically interlocked. Provide in Type 430 bright polished finish.
   1. Sizes: As indicated on drawings.

2.08 CHILDCARE ACCESSORIES (EF/CI)

A. Diaper Changing Station:
   1. “Koala Kare”; KB200-05; horizontal, wall mounted, white granite color.

B. Diaper-pack vendor:
   1. “Koala Kare” KB143-SS, recessed.

C. Child-protection seat.
1. “Koala Kare” KB102-00, creame color, 150 lbs static weight.

2.09 TOILET TISSUE DISPENSERS (EF/CI)
   A. Georgia Pacific #56790 Compact Vertical Double Roll Coreless Tissue Dispenser.

2.10 FOLD DOWN PURSE SHELF (CF/CI)
   A. Bobrick #B-287.

2.11 SEAT COVER DISPENSER (EF/CI)
   A. Georgia Pacific #57710 Safe-T-Gard ½ Fold.

2.12 WASTE RECEPTACLE (CF/CI)
   A. Bobrick #B-43644 Contura Series Recessed Waste Receptacle with Liner Mate.

2.13 ROBE HOOKS (CF/CI)
   A. Product: Bobrick B-2116.
   B. One at each toilet compartment.
   C. One at each door to single occupant toilets.

2.14 MOP AND BROOM HOLDER (CF/CI)
   A. Provide mop and broom holder complying with the following:
      1. Products: Bobrick B-223x36.
      2. Holder: 36-inch long unit fabricated of minimum nominal 1.2-mm thick, stainless-steel hat channel with four spring-loaded, rubber, cam-type, mop/broom holders.
      3. Mounting Height: 54 inches above finished floor, centered over mop sinks.
      4. Location: Provide one at each Janitor Room.

2.15 UNDERSINK PROTECTIVE PIPE COVERS (CF/CI)
   A. Provide molded cell vinyl covers at wheelchair accessible lavatory P-trap and angle valve assemblies. Covers shall be ADA conforming and antimicrobial:
      1. Products: True Bro “Lavguard”.
      2. Nominal Wall Thickness: 1/8”.
      5. Thermal Conductivity: 1.17 K plus dead air space.
      6. Locations: Provide at all lavatories which are free-standing or set in counters.

2.16 FABRICATION
   A. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item either by a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.
   B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
   C. Recessed Toilet Accessories, General: Except where otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors or access panels with full-length, stainless steel piano hinge. Provide anchorage that is fully concealed when unit is closed.
   D. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system that will permit rigid, tamperproof glass installation and prevent moisture accumulation, as follows:
      1. Provide galvanized-steel backing sheet, not less than 0.034 inch (22 gage) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.
E. Keys: Provide universal keys for access to toilet accessory units requiring internal access for servicing, resupply, etc. Provide minimum of six keys to EXCHANGE representative.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install toilet accessory units according to manufacturers’ instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.

B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, according to manufacturer’s instructions for type of substrate involved.

C. Install grab bars to withstand a downward load of at least 250 lbf, complying with ASTM F 446.

D. Verify that electrical hookups are provided for sensors.

3.02 ADJUSTING AND CLEANING

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

B. Clean and polish all exposed surfaces strictly according to manufacturer’s recommendations after removing temporary labels and protective coatings.

END OF SECTION
SECTION 10 44 13
FIRE PROTECTION SPECIALTIES

PART 1  GENERAL
1.01  SECTION INCLUDES
A. Portable fire extinguishers.
B. Fire-protection cabinets in non-rated walls for the following:
   1. Portable fire extinguishers.
C. Fire-protection accessories.

1.02  SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection specialties.
   1. Fire Extinguishers: Include rating and classification.
   2. Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.
C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of cabinet finish indicated.
D. Samples for Verification: For each type of exposed cabinet finish required, prepared on Samples of size indicated below and of same thickness and material indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.
   1. Size: 6-by-6-inch-square Samples.

1.03  QUALITY ASSURANCE
A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers."
B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
   1. Provide extinguishers listed and labeled by FM.

PART 2  PRODUCTS

2.01  MANUFACTURERS
A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Portable Fire Extinguishers (Basis of Specification – Larsen's Manufacturing Co., Series "MP"):
      a. General Fire Extinguisher Corporation.
      b. J.L. Industries, Inc.
      c. Larsen's Manufacturing Company.
      a. General Accessory Manufacturing Co.
      b. J.L. Industries, Inc.
      c. Larsen's Manufacturing Company.

2.02  MATERIALS
A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A 366/A 366M, commercial quality, stretcher leveled, temper rolled.
B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:
   2. Extruded Shapes: ASTM B 221 (ASTM B 221M).

2.03 PORTABLE FIRE EXTINGUISHERS
A. General: Provide fire extinguishers of type, size, and capacity for each cabinet and other locations indicated.
B. Multipurpose Dry-Chemical Type: UL-rated 2A-10B:C, 5-lb nominal capacity, in enameled-steel container.
C. Class K at Food Prep Areas: 6 liter; UL-rated 2A:K.

2.04 FIRE-PROTECTION CABINETS
A. Cabinet Construction: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld joints and grind smooth. Miter and weld perimeter door frames.
B. Cabinet Type: Suitable for the following:
   1. Fire extinguisher.
C. Cabinet Mounting: Suitable for the following mounting conditions:
   1. Semirecessed: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated.
D. Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.
   1. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
      a. Rolled-Edge Trim: 2-1/2-inch backbend depth.
E. Cabinet Trim Material: Aluminum.
F. Door Material: Aluminum.
G. Door Style: Manufacturer's standard design, as follows:
   1. Solid opaque panel with frame.
H. Door Construction: Fabricate doors according to manufacturer's standards, of materials indicated, and coordinated with cabinet types and trim styles selected.
   1. Provide minimum 1/2-inch-thick door frames, fabricated with tubular stiles and rails, and hollow-metal design.
I. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam-action latch, or exposed or concealed door pull and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 degrees.

2.05 ACCESSORIES
A. Mounting Brackets: Manufacturer's standard steel, designed to secure extinguisher, of sizes required for types and capacities of extinguishers indicated, with plated or baked-enamel finish.
   1. Provide brackets for extinguishers located in cabinets.
   2. Provide wall brackets for extinguishers not located in cabinets.
B. Identification: Provide lettering to comply with authorities having jurisdiction for letter style, color, size, spacing, and location. Locate as indicated by Architect.
   1. Identify bracket-mounted extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to wall surface.
   2. Identify fire extinguisher in cabinet with the words "FIRE EXTINGUISHER" applied to door.

2.06 COLORS AND TEXTURES
A. Colors and Textures: As indicated by referencing manufacturer's designations.
2.07 FINISHES, GENERAL
   A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
   C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.08 ALUMINUM FINISHES
   A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
   B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets are to be installed.
   B. Examine fire extinguishers for proper charging and tagging.
      1. Remove and replace damaged, defective, or undercharged units.
   C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION
   A. Comply with manufacturer’s written instructions for installing fire-protection specialties.
   B. Install in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
      1. Prepare recesses for cabinets as required by type and size of cabinet and trim style.
      2. Fasten cabinets to structure, square and plumb.

3.03 ADJUSTING, CLEANING, AND PROTECTION
   A. Adjust cabinet doors that do not swing or operate freely.
   B. Refinish or replace cabinets and doors damaged during installation.
   C. Provide final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION
SECTION 10 53 80
SUNSCREEN CANOPY SYSTEM

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Design, engineering, fabrication and erection of extruded aluminum space frame having a
      pre-determined area, geometry type and features indicated on the Drawings.
   B. Fabric cover as indicated on the Drawings.

1.02 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Shop Drawings:
      1. Show dimensions, sizes, thicknesses, materials, finishes, joint connections, and anchor
         brackets.
      2. Furnish separate shop drawings for fabric cover and related hardware.
   C. Submit Structural calculations by a licensed engineer for approval. Calculations shall include
      loads, member stresses, support reactions and deflections. The computer analysis and design
      shall be accompanied by comprehensive explanation of input and output.
   D. Samples:
      1. Samples of the finish shall be submitted for approval.
      2. Submit samples of fabric for color selection.

1.03 QUALITY ASSURANCE
   A. Erector Qualifications: Fabricator/erector shall be a contractor regularly engaged in the supply
      and erection of metal space frames and having experience in projects of similar size and
      complexity.
   B. Design Criteria: Space frame manufacturer shall be responsible for proper design of the
      structural system to comply with snow load and wind load indicated on the structural drawings.

1.04 DELIVERY, STORAGE AND HANDLING
   A. Framing members which are stored at the project site shall be above ground on platforms, skids
      or other supports and stored upright to prevent twisting. Protect from corrosion. Store other
      materials in a weathertight and dry place, until ready for use. Store packaged materials in their
      original unbroken package or container.

1.05 GUARANTEE
   A. Prior to final payment, furnish the Owner with a written guarantee certifying that all work was
      finished and installed in complete accordance with the contract documents.
   B. This guarantee shall certify that the installation will be completely free of defects for one (1) year
      from the date of Substantial Completion.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Space frame and fabric cover shall be designed, engineered, fabricated and erected by one of
      the following:
      1. Hendee Enterprises, Inc., P.O. Box 4289, Houston, TX 77210. Tel: 713/796-2322.
      2. Other Acceptable Manufacturers:
         b. Space Frames, Inc., 1200 W. Main Street, Melrose Park, IL. 60160. Tel: 708/345-3400.

2.02 SPACE FRAME MATERIALS
   A. Space Frame: Hendee Triangular Truss Shade System or equal of other acceptable
      manufacturer.

B. Columns: Schedule 40 galvanized steel posts.
C. Baseplates: 8 inch by 8 inch by 3/8 inch steel.
D. Finish:
   1. Aluminum Components: Manufacturer’s standard mill finish.
   2. Steel Components: Hot dipped galvanized.

2.03 FABRICATION
A. The space frame shall be constructed using the extruded aluminum components and alloys as specified.
B. All cutting and fabrication shall be performed in the shop.
C. All field construction of space frame shall be made with bolts or pins.
D. All components shall be color coded for easy field assembly.

2.04 FABRIC
A. Fabric: Enduro Fabric as manufactured by Hendee Enterprises of vinyl impregnated polyester yarn, or accepted substitute by other acceptable manufacturer.
   1. Fire retardant treated.
   2. Shade Factor: 63 percent.
   3. Colors: Spiced Sand
B. Edge Reinforcement: 2 inch webbing.
C. Grommets: #2 3/8 inch brass spur grommets at 12 inches o.c.
D. Attachment Hardware: Stainless steel springs fabricated in accordance with SST-302 ASTMA-A-313.
E. Fabric supplier shall furnish all cables and fastening hardware to make a taunt installation.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verification of Conditions: The space frame constructor shall determine whether the support system to receive the anchor mounts is properly prepared and ready to receive the work included herein. Responsibility for the accuracy of benchmarks shall be that of the general contractor.
B. In the event of error in the support locations, the space frame contractor shall notify the general contractor in sufficient time for the correction without undue delay to the project. No further erection work shall be done until the faulty work has been corrected.

3.02 INSTALLATION
A. The space frame shall be completely erected and cover installed by the space frame manufacturer.
B. The installation shall be under the supervision of the space frame manufacturer's crew site engineers.
C. The method and sequence of the assembly procedure shall be done to standards set forth by the space frame manufacturer.
D. The anchor mounts shall be field welded as per AISC requirements. All welded areas shall be field painted to prevent corrosion.
E. The space frame shall be delivered to the site and erected in a clean condition, without any damage or deterioration at the time of completion of installation. Protection shall be provided for space frame components. As the space frame is installed, any areas which may be
damaged during assembly shall be touched-up; the touch-up paint shall be air dried to match factory painted finish.

F. Fabric Cover: Install over space frame according to manufacturer's instructions and approved shop drawings.

END OF SECTION
PART 1 GENERAL
1.01 SECTION INCLUDES
A. Roll-formed aluminum, wall-attached, overhead-rod-style canopies.
B. Extruded aluminum, freestanding, double-overhang-style canopies.

1.02 RELATED SECTIONS
A. Section 03 30 00 - Cast-in-Place Concrete.
B. Section 07 90 05 - Joint Sealers.

1.03 REFERENCES
A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.

1.04 DESIGN REQUIREMENTS
A. Canopy materials, assembly and attachments shall resist applicable ASCE 7 and IBC 2015 code-mandated loads and positive and negative wind design loads at any point without damage or permanent set.

1.05 SUBMITTALS
A. See Section 01 33 00 - Submittals, for submittal procedures.
B. Product Data: Provide manufacturer's standard literature and specifications for canopies.
C. Shop Drawings: Indicate structural component locations/positions, material dimensions and details of construction and assembly.
D. Samples: Submit samples of each type and color of finish available, for selection by Contracting Officer's Representative.
E. Certification: Provide letter of compliance certifying that the proposed canopy design and layout meets or exceeds all applicable loadings (e.g. wind load, rain live load, dead load, snow load) for the job location (city and state) in accordance with the IBC and ASCE 7.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Wall-Attached Canopies:
   1. Mapes Industries, Inc; Product "Lumishade Hanger Rod Canopy": www.mapes.com; or approved equivalent.
B. Freestanding Canopies:

2.02 WALL-ATTACHED CANOPY SYSTEM
A. Materials:
   1. Decking: Interlocking, roll-formed aluminum, 2-1/2 inch deep W-style pan, minimum 0.032 inch thick.
2. Intermediate Framing Members: Extruded aluminum, alloy 6063-T6, of manufacturer’s standard profiles.
3. Hanger Rods and Attachment Hardware: Galvanized/zinc plated, powder coated.
4. Fascia: Minimum 0.125 inch thick extruded aluminum, 8 inches high, Style "J" fascia.

B. Finish: Factory-applied baked enamel complying with AAMA 2603.
   1. Color: Dark bronze.

2.03 FREESTANDING CANOPY SYSTEM

A. Design and Assembly:
   1. Canopies shall be mechanically fastened using internally welded brackets and concealed stainless steel fasteners. Welded connections may be used if shipping allows.
   2. Beams shall be notched to receive the extruded gutter to allow the decking to sit flush to the top of the beam.
   3. Extruded decking shall be of a roll-locked design where the extruded cap and pan interlock to make a rigid structure. Crimped decking and roll-formed decking will not be allowed.
   4. Canopies shall drain from the decking to the perimeter gutters, into the drain beams, and discharge at the bottoms of the columns into storm water sub-drain system as indicated.
   5. Deflector plates shall be installed at the bottoms of the drain columns to discharge the water away from the columns. The deflector plates shall be sealed inside the columns and fastened to the columns using a single rivet.
   6. Columns shall be locked into the post footers using a single piece of rebar, approximately 7 inches long, running through the bottom of the column below the finished pavement level.

B. Materials:
   1. Columns:
      a. Columns shall be radius-cornered tubular extruded aluminum of minimum 4 x 4 inch size, 0.125 inch thick.
      b. Provide clear acrylic protection or bituminous paint protection between the aluminum column and the concrete footer.
      c. Water outlet holes shall be cut at the bottom of all draining columns, with deflector plates installed inside. Coordinate size, shape, and location of holes with storm water sub-drain system piping.
   2. Beams:
      a. Beams shall be open-topped aluminum tubular extrusions of minimum 4 x 6 inch size, 0.125 inch thick.
      b. Size of beams used shall accommodate applied loadings without over-stress or over-deflection.
   3. Decking:
      a. Decking shall be minimum 0.060 inch thick extruded aluminum of a rigid roll-lock design that is self-flashing and utilizes interlocking sections.
      b. Decking shall consist of a 3 inch deep x 6 inch wide cap and pan design.
   4. Gutters:
      a. Gutters shall be radius-cornered aluminum extrusions of minimum 4 x 6 inch size, 0.093 inch thick.
   5. Flashing:
      a. Flashing shall be made of aluminum sheet painted to match the color of the decking. Minimum flashing thickness shall be 0.040 inch thick.

C. Fasteners:
   2. Rivets: 3/16 inch aluminum.

D. Finish:
   1. Finish: Factory-applied baked enamel complying with AAMA 2603.
      a. Color: Dark bronze.
2.04 FABRICATION - FRAMING

A. Fit and shop assemble components in largest practical sizes, for delivery to site.
B. Fabricate components with joints tightly fitted and secured. Corners shall be mitered and secured by means of internal aluminum corner angles.
C. Concealed Drainage:
   1. Wall-Attached Canopy Systems: Water shall drain from covered surfaces into intermediate trough and be directed to either the front for front drainage or to the rear for ground-level discharge via one or more designated downspouts.
   2. Freestanding Canopy Systems: Water shall drain internally, from fascia/gutter to columns, and be discharged at or near finished grade level. Cantilevered canopies shall be downspouted from fascia/gutter to columns via extruded aluminum drain beams and shall discharge at or near finished grade level.
D. Exposed Fastenings: Unobtrusively located; consistent with design of component, except where specifically noted otherwise.
E. Supply components required for anchorage of framing. Fabricate anchors and related components of same material and finish as framing, except where specifically noted otherwise.

PART 3 EXECUTION

3.01 EXAMINATION

A. Confirm that surrounding area is ready for the canopy installation.

3.02 WALL-ATTACHED CANOPY INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings after all concrete, masonry and roofing work in the area is completed.
B. Install components plumb and level, accurately fitted, free from distortion or defects.
C. Provide anchors required for connecting framing to structure. Anchor framing to structure.
D. Protect finish during handling and erection.

3.03 COLUMN FOOTINGS AT FREESTANDING CANOPIES

A. Canopy manufacturer shall provide styrofoam blockouts to the General Contractor.
B. General Contractor shall pour the required footer size around the styrofoam blockouts provided by the canopy manufacturer.
C. Canopy installer shall remove the styrofoam after footers have cured, set columns in the cavity, and fill with minimum 3000 psi grout to level of finished concrete slab.

3.04 FREESTANDING CANOPY INSTALLATION

A. Canopies shall be installed in accordance with manufacturer's instructions, approved shop drawings, and plans.
B. The entire structure shall be installed straight, true, and plumb.
C. Canopies shall be installed with positive and negative slope of 1/8 inch per foot to allow water drainage from top of canopy to draining columns and eliminate ponding.
D. Non-draining columns shall have weep holes installed at top of concrete to remove condensation from post. Minimum weep hole size shall be 1/4 inch in diameter.
E. Protect finish during handling and erection.
F. All joints, corners, and connections shall be tight and clean.
G. All exposed fasteners shall be painted to match the canopy color.
H. Decking shall be aligned and secured to aluminum frame structure.
3.05 CLEANING

A. Clean metal canopy surfaces in accordance with manufacturer's instructions.

END OF SECTION
SECTION 11 40 00
FOOD SERVICE EQUIPMENT (EF/CI)

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Built in food equipment, walk-in refrigeration, hoods.

1.02 RELATED REQUIREMENTS
   A. Section 01 10 17 - Exchange Furnished and Installed Equipment (EF/EI).
   B. Section 01 10 18 - Exchange Furnished, Contractor Installed Equipment (EF/CI).
   C. Division 22 Section - Plumbing Piping.
   D. Division 22 Section - Plumbing Specialties: Grease interceptor.
   E. Division 23 Section - Food Service Ventilation Systems.
   F. Division 26 - Electrical.

1.03 REFERENCES
   A. ASTM A167 - Stainless and Heat-resisting Chromium-nickel Steel Plate, Sheet and Strip.
   C. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
   D. ASTM C1036 - Flat Glass.
   E. ASTM C1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
   F. NEMA LD3 - High Pressure Decorative Laminates.
   H. NFPA 96 - Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment.
   I. NGA - National Gas Association: Appliances.
   J. NSF - National Sanitation Foundation: Appliances.

1.04 PERFORMANCE REQUIREMENTS
   A. Load Supporting Components: Reinforced frame support system and surfaces where indicated so that surfaces may safely support a load of 200 lbs concentrated on one square foot in any area on the component surface, with no indentation showing on surface, and with permanent set not exceeding 0.005 inches.

1.05 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Shop Drawings: Indicate in large scale detail, fabricated equipment showing construction methods, type and gage of metal, hardware and fittings, plan front elevation, a minimum of one cross-section, and utility requirements as to types and sizes and locations. Illustrate complicated parts of typical items in cut-away perspective. For control systems, indicate service connections, characteristics, and wiring diagrams.
   C. Product Data: Provide data on appliances; indicate configuration, sizes, materials, finishes, locations, and utility connections and locations.
   D. Samples: Submit two (2) samples, 6" x 6" inch in size illustrating equipment and finish.
   E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
   F. Manufacturer's Certificate: Certify that Products meet or exceed UL and specified requirements.
1.06 OPERATION AND MAINTENANCE DATA
A. Submit under provisions of Section 01 77 00.
B. Operation Data: Provide operating data for the specified equipment.
C. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.

1.07 QUALITY ASSURANCE
A. Perform Work as follows:
   1. Cooler and Freezer Units: Listed by Underwriters Laboratories, Inc. (UL) standards.
   4. Fabricated Equipment: Shall be installed in accordance with the following codes: NFPA - National Fire Protection Association requirements, NGA - National Gas Association requirements, NSF - National Sanitation Foundation requirements.

1.08 QUALIFICATIONS
A. Fabricator: Company specializing in performing the work of this section with minimum five (5) years experience.

1.09 REGULATORY REQUIREMENTS
A. Conform to applicable code for utility requirements.
B. Products Requiring Electrical Connection: Listed and classified by Underwriters’ Laboratories, Inc., as suitable for the purpose specified and indicated.

1.10 PRE-INSTALLATION CONFERENCE
A. Convene one week prior to commencing work of this section, under provisions of Section 01 31 00.

1.11 DELIVERY, STORAGE, AND HANDLING
A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
B. Store products clear of floor in a manner to prevent damage.
C. Coordinate size of access and route to place of installation.

1.12 SCHEDULING
A. Schedule work under the provisions of Section 01 31 00.
B. Schedule Work to immediately follow installation of utilities and precede installation of room finishes.

1.13 COORDINATION
A. Coordinate the work with location and placement of utilities. Coordinate characteristics of utilities with requirements of food service equipment.

1.14 WARRANTY
A. Provide five (5) year warranty under provisions of Section 01 77 00.
B. Warranty: Include replacement or repair of scheduled equipment, refrigerant and compressors, including disconnection of defective unit, and connection of replacement unit.

PART 2 PRODUCTS
2.01 EQUIPMENT SCHEDULE
A. Equipment Schedule: Refer to Drawings.
B. Provide rough-in hardware, supports and connections, attachment devices, closure trim, and accessories.

2.02 MATERIALS
A. Sheet Steel: ASTM A446, 1.25 oz/sq ft galvanized coating.
B. Stainless Steel: ASTM A167, Type 304 commercial grade, No. 4 finish.
C. Sealants: Silicone, bacteria resistant type.

2.03 FABRICATION - GENERAL
A. Fabricate sheet material for work surfaces, facings, shelves, and drain boards of straight lengths in one continuous sheet when less than 12 ft in length. Fit and attach integral sinks. Weld metal joints for lengths over 12 ft.
B. Weld and form edges, ends, and joints smooth. Grind welds of stainless steel smooth and flush; polish to match adjacent surfaces.
C. Cut and drill components for service outlets and fixtures.
D. Fix leg mounted units by dowelling to floor with 1/4 inch stainless steel pins, where vibration or oscillation is anticipated.
E. Provide stainless steel legs with adjustable feet. Fasten legs to equipment securely and rigidly.
F. Install nylon button feet on bearing surface of any item positioned on a finished surface.
G. Isolate rotating or reciprocating machinery to prevent noise and vibration.
H. Provide indirect drain piping from equipment to terminate over nearest waste receptor.
I. Accommodate site installation of other services or equipment.
J. Shop assemble work where possible.
K. Stainless Steel Fastenings and Fittings: Bolt and screw with countersunk flat heads at visible or accessible surfaces. Use concealed fastenings where possible.

2.04 FINISHES
A. All Components: Shop pre-finish.
B. Metal (Except Stainless Steel): Degrease and phosphate etch, prime and apply minimum two coats factory baked epoxy enamel, color as selected.
C. Stainless Steel: No. 4 finish.
D. Bituminous Paint: Sound deaden internal surfaces of metal work and underside of metal counters.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify ventilation outlets, service connections, and supports are correct and in required location.
B. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION
A. Install items in accordance with manufacturers’ instructions.
B. Insulate to prevent electrolysis between dissimilar metals.
C. Weld and grind joints in steel work tight, without open seams, where necessary due to limitations of sheet sizes or installation requirements.
D. Sequence installation and erection to ensure correct mechanical and electrical utility connections are achieved.
E. Cut, fit, and patch where necessary. Provide cutting and patching of items of this section required for installation or services of equipment.
F. Cut and drill components for service outlets, fixtures, and fittings.
G. Use anchoring devices appropriate for equipment and expected usage.
H. Provide sealant to achieve clean joint with adjacent building finishes and between abutting components.
3.03 **ADJUSTING**
A. Adjust work under provisions of Section 01 65 00.
B. Adjust equipment and apparatus to ensure proper working order and conditions.
C. Remove and replace equipment creating excessive noise or vibration.

3.04 **CLEANING**
A. Clean work under provisions of 01 71 00.
B. Remove masking or protective covering from stainless steel and other finished surfaces.
C. Wash and clean equipment.
D. Polish glass, plastic, hardware and accessories, fixtures and fittings.

3.05 **DEMONSTRATION**
A. Provide systems demonstration under provisions of Section 01 65 00.
B. Test equipment prior to demonstration.
C. At completion of work, provide qualified and trained personnel to demonstrate operation of each item of equipment and instruct Owner in operating procedures and maintenance.
D. Individual Performing Demonstration: Fully knowledgeable of all operating and service aspects of equipment.

3.06 **PROTECTION OF FINISHED WORK**
A. Protect finished Work.
B. Remove protective coverings from pre-finished work.

**END OF SECTION**
SECTION 12 69 00
ENTRY FLOOR MATS

PART 1 - GENERAL
1.01 SECTION INCLUDES
   A. Surface-applied floor mats of the following type:
      1. Roll-up mats.

1.02 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product data for each type of floor mat specified, including manufacturer's specifications and
      installation instructions, details of construction relative to materials, dimensions of individual
      components, profiles, and finishes.
   C. Samples for verification showing color selection and mat type.

1.03 PROJECT CONDITIONS
   A. Field Measurements: Check actual framed openings for mats by accurate field measurements
      before fabrication; show recorded measurements on final shop drawings. Coordinate
      fabrication schedule with construction progress to avoid a delay of the Work.
      1. Where field measurements cannot be made without delaying the Work, guarantee opening
         dimensions and proceed with fabrication without field measurements. Coordinate floor
         construction to ensure that actual opening dimensions correspond to guaranteed
         dimensions.

1.04 QUALITY ASSURANCE
   A. Single-Source Responsibility: Obtain floor mats from one source of a single manufacturer.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
   A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering
      products that may be incorporated in the Work include, but are not limited to, the following:
   B. Manufacturers: Subject to compliance with requirements, provide products by one of the
      following:
      1. Roll-up Mats:
         a. AFCO-USA
         c. Consolidated Plastics Co., Inc.
         d. Construction Specialties, Inc.
         e. Mats, Inc.
         f. R.C. Musson Rubber Company.
         g. Tennessee Mat Company, Inc.
         h. Pawling Corporation

2.02 FLOOR MATS
   A. General: Provide colors, patterns and profiles of materials, including metals and metal finishes
      indicated or specified. If not indicated, provide colors, patterns and profiles selected by
      Architect from manufacturer’s standards.
   B. Roll-up Mats: Design is based on Rol-Dek Model EM-800, from Pawling, Inc.
      1. Rails: Hinged aluminum, extruded profile, non-perforated; assembled at 1-7/8 inches on
         center.
      2. Resilient pads: Continuous co-extruded vinyl support cushion secured to each rail to
         reduce noise and movement.
      3. Tread inserts: Maxi-Tuft Long Wear nylon carpet (MLW); inserts 1 inch wide, spaced
         1-1/2 inches on center; tufted, 5/32 inch pile, 100 percent polyamide nylon fibers with 100
         mil vinyl backing; 35 oz/sq. yd. pile weight with 80 Dtex tetralobal fiber design, tufted at
78,000 fibers per square meter; minimum static coefficient of friction, 0.49 dry, 0.77 wet; treads positively secured into rails or an equal tread insert from another approved manufacturer.

4. Nosings: Provide Square or Beveled vinyl nosings as required to coordinate with height and configuration of adjacent thresholds.

5. Overall depth: 7/16 inch.

6. Colors:
   b. Tread Inserts: Charcoal.

2.03 FABRICATION
   A. General: Where possible, verify sizes by field measurement before shop fabrication.
   B. Floor Mats: Shop fabricate units to greatest extent possible in sizes as indicated. If not otherwise indicated, provide single unit for each mat installation; do not exceed manufacturer's recommended maximum sizes for units that area removed for maintenance and cleaning. Where joints in mats are necessary, space symmetrically and away from normal traffic lanes. Miter corner joints in framing elements with hairline joints or provide prefabricated corner units without joints.
   C. With manufacturer's standard protective coating, coat surfaces of aluminum frames that will contact cementitious material.

2.04 FINISHES, GENERAL
   A. Comply with NAAMM’s “Metal Finishes Manual for Architectural and Metal Products” for recommendations for applying and designating finishes.
   B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

2.05 ALUMINUM FINISHES
   A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
   B. Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker, complying with AAMA 611.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Examine substrates and floor conditions for compliance with requirements for location, sizes and other conditions affecting installation of floor mats.
   B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION
   A. Install mats to comply with manufacturer’s written instructions. Coordinate level transition between top of mat surfaces with height of adjacent thresholds. Coordinate top of mat surfaces with bottoms of doors that swing across mats to provide clearance between door and mat.

END OF SECTION
SECTION 13 27 53
MODULAR VAULT SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. GSA lightweight, bolted modular vault system with a Class 5 vault door.

1.02 RELATED SECTIONS
   A. Division 26 - Electrical: Intruder detection system and lighting for modular vault system.

1.03 REFERENCE STANDARDS
   A. FS AA-D-600 - Door, Vault, Security; Federal Specification; 2010, Revision D.
   C. UL 608 - Underwriters Laboratories; Burglary Resistant Vault Doors and Modular Panels; current edition, including all revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination: Coordinate the installation of the modular vault system with size, location and installation of service utilities.
   B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.05 SUBMITTALS
   A. See Section 01 33 00 - Submittals, for submittal procedures.
   B. Product Data: Provide data on system components, describing physical features and performance characteristics, including sizes; and installation instructions.
   C. Shop Drawings: Indicate system layout and dimensions; opening sizes; tolerances; head, jamb and sill conditions at vault door; elevations; components; connection requirements; and affected related Work.
   D. Certificate: Certify that products of this section meet or exceed specified requirements.
   E. Installer’s Qualification Statement.
   F. Manufacturer's Installation Instructions: Indicate sequence of work, installation recommendations, and special procedures.
   G. Maintenance Data: Include manufacturer’s parts list and maintenance instructions for each type of hardware and operating component.
   H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
   B. Erector Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Modular Vault Systems:

2.02 MODULAR VAULT SYSTEMS
1. Classification: Type I - Lightweight; Style A - Six sided.
   a. Assembly: Bolted.
2. UL Classification: Type M.
3. Vault Size: 8’ x 10’ x 8’ high minimum clear interior dimensions.

B. Door: GSA-labeled single-leaf Class 5-V security vault door meeting Federal Specification AA-D-600D, with the following features:
   1. Low-torque handle operation.
   2. Inside emergency escape handle.
   3. Tumbler key-change combination lock.
   4. Pre-hung in frame, designed for easy clamp-on installation.
   5. Door stop.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install in accordance with approved shop drawings and manufacturer's instructions.

3.02 ADJUSTING
   A. Adjust door assembly for smooth operation.

3.03 CLEANING
   A. Remove temporary protection and clean exposed surfaces.

3.04 CLOSEOUT ACTIVITIES
   A. Demonstrate proper operation of vault door to Owner's designated representative.

3.05 PROTECTION
   A. Protect installed modular vault system from subsequent construction operations.

END OF SECTION
SECTION 13 34 19
METAL BUILDING SYSTEMS (CANOPY)

PART 1 GENERAL

1.01 SECTION INCLUDES
A. All labor, equipment and material and incidentals to design, furnish and install a prefabricated/pre-engineered metal canopy to include footings, as shown on the drawings and described herein.

1.02 RELATED REQUIREMENTS
A. Section 01 14 50 - Cutting and Patching.
B. Section 03 30 00 - Cast-in-Place Concrete.

1.03 QUALITY ASSURANCE
A. Structures shall be the product of a manufacturer with a minimum of 20 years documented experience in the design and fabrication of steel canopies.
B. A professional engineer licensed in the State the project is occurring in shall accomplish structural design. Design shall be accomplished in accordance with State and local building codes.
C. Verify all dimensions shown on drawings by taking field measurements to insure proper fit and attachment of all component parts.

1.04 SUBMITTALS
A. See Section 1 33 00 - Submittals, for submittal procedures.
B. Furnish complete literature and installation and assembly drawings to the Contracting Officer for approval prior to fabrication and installation to include:
   1. Manufacturer's data
   2. Drawings shall indicate materials, finish size and methods of fabrication, assembly, and installation.
   3. Calculations for design of the canopy structure and footings shall be submitted for approval prior to fabrication. A professional engineer in the State the project is occurring in for entire canopy structures and footings shall seal design calculations. A subsurface investigation or geotech study, if available, will be presented. If a subsurface investigation is not presented, all investigations required for the design of the canopy and footings shall be acquired by and at the expense of the Contractor.
C. Submit color charts illustrating all finish colors and patterns.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING
A. Deliver items in manufacturer’s original protective packaging.
B. Handle so as to prevent damage to finished surface.
C. Maintain protective covers on all items until installation is complete.

PART 2 PRODUCTS

2.01 STRUCTURAL STEEL FRAMING
A. Columns shall be fabricated from hollow structural sections conforming to ASTM A500 Grade B, with minimum yield strength of 46 ksi. ASTM A36 structural steel plate with minimum yield strength of 36 ksi with pre-punched or pre-drilled bolt holes shall be used for column top and base plates. Columns shall be provided with electrical access openings, cover plates, conduits and drains per owner requirements.
B. Wide flange beams conforming to ASTM A572 Grade 50 with minimum yield strength of 50 ksi shall be used as the primary roof-framing members. Other roof-framing members (channel, angle, or tees), if used, shall conform to ASTM A36 with minimum yield strength of 36 ksi. Bracing shall be designed as required by design.
C. Structural steel plate shall conform to ASTM A36 with minimum yield strength of 36 ksi.
D. Structural bolts shall conform to ASTM A325 Specification for High Strength Bolts for Structural Steel Joints. All structural steel framing members shall be shop fabricated for field bolted assembly, unless otherwise specified on drawing.
E. Anchor bolts shall conform to ASTM A36 with minimum yield strength of 36 ksi. Double nuts and washers shall be provided with each anchor bolt, with one set to be used for leveling column.
F. All structural steel framing members shall be cleaned to remove loose mill scale and other foreign matter.
G. After cleaning, all members shall be given one shop coat of rust-inhibitive primer. The primer coat thickness shall be a minimum of 1 mil.

2.02 DECK PANEL
A. Roof deck panels shall conform to ASTM A653 Grade 40 steel with minimum yield strength of 40 ksi, with a G60 galvanized surface per ASTM A924.
B. Panel profile shall have a minimum thickness of 24 gauge.
C. Panels shall have a finish side coated with a full coat of white polyester paint baked on over an epoxy primer. A white wash coat baked on over an epoxy primer shall protect the interior side of the panel.
D. Panels shall be fastened to the bottom flange of the wide flange purlin beams with a system, which requires no "through the panel" fasteners.
E. Deck panels shall not be spliced.

2.03 FASCIA SYSTEM
A. Aluminum Composite Material Panels shall be provided with a 3 mm thick pre-finished aluminum composite material substrate. Finish color shall be factory applied. Color per EXCHANGE requirements.
B. Fascia outriggers shall be cold formed 2” x 2” x 20 gauge steel angles conforming to ASTM A653 Grade CS with a minimum yield strength of 25 ksi, with a G90 galvanized surface per ASTM A924. 2” x 2” x 18 gauge or 2” x 2” x 1/8 inch structural angle shall be used as required by design. Outrigger spacing per design requirements.
C. There shall be no exposed fasteners on exterior or bottom face of fascia panels.
D. Vertical seams shall be sealed from backside.
E. 24 gauge flashing shall be used as required by design.

2.04 GUTTER
A. Gutter shall conform to ASTM A653 Grade 40 steel with minimum yield strength of 40 ksi, with a G60 galvanized surface per ASTM A924.
B. Profile shall be at a minimum be 12-inch wide x 4-inch deep, 24 gauge thick.
C. Gutters shall have a finish side coated with a full coat of polyester paint baked on over an epoxy primer. A white wash coat baked on over an epoxy primer shall protect the interior side of the gutter.
D. Gutter leaders to column drain shall be one of the following options: 3 inch diameter PVC pipe with a 24 gauge leader cover (dry leader) or an 8 inch wide tapered (4 inch to 6 inch deep) 24 gauge steel leader (wet leader). Larger gutters shall be used where required for proper drainage.

2.05 DOWNSPOUTS
A. External downspouts shall be 3” x 4” roll formed aluminum with watertight locked seams. Exterior side coated with a full coat of polyester paint baked on over an epoxy primer color per EXCHANGE requirements. Eternal downspouts shall be mounted to the face of the column and be of one continuous length. Larger drains shall be used where required for proper drainage.
B. Internal downspouts shall be 3 inch diameter PVC with couplings provided at gutter leader attachment location and at base of column where attachment to site drainage system is required. Larger drains shall be used where required for proper drainage.

2.06 SEALANTS
A. Exposed joints shall be sealed with a high-quality silicone caulk color to match.
B. Non-exposed joints shall be sealed with white or bronze polyurethane sealant.
C. Other sealant such as Black Mastic, strip caulk or double-sided tape shall be used as required by design.

2.07 FOOTINGS
A. Footings shall be designed and installed by the fabricator. Designs shall conform to State and local building codes. A professional engineer in the State the project is occurring in shall seal design calculations. Calculations shall be submitted for approval prior to placing the footings. Footings shall be reinforced concrete. Subsurface investigations shall be the responsibility of the fabricator.
B. Concrete shall conform to ACI 301.
C. Reinforcement shall conform to ASTM A615.

PART 3 EXECUTION
3.01 INSTALLATION
A. Footings shall be placed in conformance with CRSI 63 and 67. Anchor bolts and templates shall be shipped to owner prior to pouring canopy footings.
B. Structural steel shall be set plumb, square and level in accordance with Erection drawings provided by the fabricator. Erection of structural steel shall be in accordance with the latest AISC Specifications and Code of Standard Practice. All structural bolts shall be tightened by the turn-of-the-nut method as specified in the latest RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts.
C. Deck, fascia, and gutter systems, as well as other accessories shall be assembled in accordance with by the fabricator.

3.02 ADJUST AND CLEAN
A. After installation, make final adjustments to ensure all members fit and are aligned properly.
B. After final adjustment, all metal surfaces shall be cleaned in accordance with the manufacturer’s recommendations.
C. Leave work area clean and free of debris.

END OF SECTION