



# EXCHANGE

™ Army and Air Force Exchange Service

**PROJECT MANUAL**  
**BRYAN VILLAGE SHOPPETTE**  
**IMAGE UPGRADE**  
**AT**  
**FORT STEWART, GEORGIA**

AAFES PROJECT NUMBER 0756-10-000007

# BID SET

February 1, 2012



A/E:

**PWBA ARCHITECTS, INC.**  
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SET NO. \_\_\_\_\_

**SECTION 00002**

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**END OF PROJECT DIRECTORY**

SECTION 00003

TABLE OF CONTENTS

**DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS**

00001	Project Title Page.....	1
00002	Project Directory.....	1
00003	Table of Contents.....	4
00004	List of Drawings.....	1

**DIVISION 1 - GENERAL REQUIREMENTS**

01010	Summary of the Work.....	9
01045	Cutting and Patching.....	2
01220	Progress Meetings.....	2
01300	Submittals.....	3
01400	Quality Control.....	2
01420	Environmental Protection .....	7
01500	Temporary Facilities and Controls.....	4
01520	Construction Progress Schedule .....	3
01585	Project Signs.....	2
01585A	Project Signs Details .....	1
01600	Product Requirements .....	5
01710	Cleaning.....	2
01720	Project Record and Closeout Documents.....	3
01732	Waste Management.....	5
01734	Indoor Air Quality.....	3
01820	Demonstration and Training.....	3

**DIVISION 2 - SITE WORK / DEMOLITION**

02060	Demolition and Removals .....	2
-------	-------------------------------	---

**DIVISION 3 - CONCRETE**

03100	Concrete Formwork.....	3
03200	Concrete Reinforcement .....	3
03300	Cast-In-Place Concrete .....	7
03354	Interior Concrete Slab Repairs.....	11
03356	Polished Concrete Floor Finish .....	8

**DIVISION 4 - MASONRY**

NOT REQUIRED

**DIVISION 5 – METALS**

05500 Metal Fabrication.....5

**DIVISION 6 - WOOD AND PLASTICS**

06100 Rough Carpentry.....5  
06410 Custom Cabinets.....4

**DIVISION 7 - THERMAL AND MOISTURE PROTECTION**

07900 Joint Sealers.....6

**DIVISION 8 - DOORS AND WINDOWS**

08110 Steel Frames.....4  
08211 Flush Wood Doors.....3  
08385 Double-Acting Traffic Doors.....3  
08710 Finish Hardware.....6  
08800 Glazing.....4  
08910 Metal-Framed Curtain Wall.....6

**DIVISION 9 - FINISHES**

09260 Gypsum Board Assemblies.....6  
09300 Tile.....3  
09511 Suspended Acoustical Ceilings.....4  
09650 Resilient Flooring.....4  
09900 Paints and Coatings.....5

**DIVISION 10 - SPECIALTIES**

10425 Signs.....2  
10522 Fire Extinguishers Cabinets and Accessories.....2  
10800 Toilet Accessories.....3

**DIVISION 11 - EQUIPMENT**

11400 Food Service Equipment.....6

**DIVISION 12 - FURNISHINGS**

NOT REQUIRED

**DIVISION 13 – SPECIAL CONSTRUCTION**

NOT REQUIRED

**DIVISION 14 – CONVEYING SYSTEMS**

NOT REQUIRED

**DIVISION 15 - MECHANICAL**

15010	Basic Mechanical Requirements.....	5
15050	Basic Mechanical Materials and Methods .....	3
15081	Mechanical Systems Insulation .....	4
15410	Plumbing Piping .....	7
15440	Plumbing Fixtures.....	6
15815	Metal Ducts .....	7
15820	Duct Accessories.....	6
15950	Testing, Adjusting, and Balancing.....	7

**DIVISION 16 - ELECTRICAL**

16000	Electrical Work – General .....	2
16100	Raceways .....	2
16120	Outlet Boxes .....	2
16200	Conductors .....	2
16300	Wiring Devices .....	2
16450	Grounding Systems .....	1
16500	Panelboards .....	1
16550	Safety Switches .....	1
16570	Fuses.....	1
16600	Lighting System.....	1
16800	Fire Alarm System .....	2

END OF SECTION

**SECTION 00004**

**LIST OF DRAWINGS**

<b>SHT. NO.</b>	<b>SHEET TITLE</b>
<b>GENERAL</b>	
T001	TITLE SHEET, INDEX TO DRAWINGS & VICINITY LOCATION MAPS
PH001	PHASING PLAN
<b>CIVIL</b>	
C101	SITE PLAN
<b>ARCHITECTURAL</b>	
A101	EXISTING FLOOR PLAN
A102	DEMOLITION FLOOR PLAN
A103	NEW FLOOR PLAN AND LIFE SAFETY
A104	EXISTING/ DEMOLITION REFLECTED CEILING PLAN
A105	NEW REFLECTED CEILING PLAN
A106	EXISTING ROOF PLAN
A401	LARGE SCALE SNACK AVENUE PLAN, ELEVATIONS, SCHEDULE AND SECTION
A600	FINISH SCHEDULE, LEGEND & INTERIOR ELEVATIONS
EQ-1	EQUIPMENT FLOOR PLAN
<b>PLUMBING</b>	
P101	PLUMBING LEGENDS, SCHEDULES, DETAILS, NOTES & RISER DIAGRAMS
P201	PLUMBING LAYOUT NON PRESSURE PIPING
P202	PLUMBING LAYOUT PRESSURE PIPING
<b>MECHANICAL</b>	
M101	GENERAL NOTES, SCHEDULES AND LEGENDS
M102	DEMO PLAN
M103	FLOOR PLAN MECHANICAL NEW WORK
M104	MECHANICAL DETAILS
<b>ELECTRICAL</b>	
E001	ELECTRICAL LEGEND, NOTES, AND SCHEDULES
E101	LIGHTING PLAN
E201	POWER PLAN
E202	SNACK AVENUE-ELECTRICAL EQUIPMENT SCHEDULE
E301	FIRE ALARM & SECURITY PLAN

**END OF SECTION**

## SECTION 01010

### SUMMARY OF THE WORK

#### PART 1 GENERAL

##### 1.01 STATEMENT OF WORK

- A. Scope: The work covered by these construction documents consists of furnishing all supervision, labor, equipment, materials, and appliances necessary to perform all operations required to install, alter, construct and complete the work, all in accordance with these specifications and the applicable drawings, and subject to the terms and conditions of the contract.
- B. Location: The work to be performed is located at Ft. Stewart, Georgia. The work will be performed at the Bryan Village Shoppette.
- C. Principal Features: The work to be performed in connection with this project includes, but is not limited to the following:
  - 1. Activate Shoppette Reimaging work with the following elements:
    - a. Provide selected interior finishes in the major spaces with reworked MPA, offices & break areas.
    - b. Provide lighting / power / auxiliary systems.
    - c. Provide HVAC systems / plumbing work.
    - d. Modify exterior to provide new openings..
    - e. Provide and install Snack Avenue equipment per schedules as well as store fixtures.
    - f. New freezer/cooler unit supplied by AAFES or AAFES vendors with power hook-ups by GC.
    - g. All other work shown on the drawings and/or miscellaneous incidental work not shown that may be required to complete the project.

##### 1.02 DRAWINGS AND SPECIFICATIONS

- A. After Contract award, and for construction purposes only, the General Contractor (GC) will be provided with a record set of drawings and specifications and a reproducible set of drawings and specifications. Additional copies will be the responsibility of the General Contractor.

##### 1.03 SUBSTITUTIONS

- A. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.
- B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Contracting Officer or designated representative not less than 10 days prior to the solicitation due date. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Contracting Officer or designated representative's decision of approval or disapproval of a proposed substitution shall be final.

- C. If the Contracting Officer or designated representative approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Amendment. Bidders shall not rely upon approvals made in any other manner.
- D. No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

#### **1.04 LAYING OUT WORK**

- A. Dimensions and elevations indicated in layout of work shall be verified by the GC. Discrepancies between drawings, specifications, and existing conditions shall be referred to the Contracting Officer or designated representative in writing for adjustment before work affected is performed. Failure to make such notifications shall place responsibility upon the GC to carry out work in satisfactory, workmanlike manner without extra costs.
- B. The GC shall be held responsible for the location and elevation of all the construction contemplated by the Construction Documents.
- C. Prior to commencing work, the GC shall carefully compare and check, Architectural, Mechanical and Electrical drawings each with the other, that in any way affect the locations and elevations of the work to be executed by him, and should any discrepancy be found, he shall immediately report the same to the Contracting Officer or designated representative for verification and adjustment. Any duplication of work made necessary by failure or neglect on the GC'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 shall be established by shop drawings and is subject to minor changes necessitated by field conditions which shall be made as required without additional cost to AAFES. Measurements shall be verified by actual observations at the construction site, and the GC shall be responsible for all work fitting into place in a satisfactory and workmanlike manner meeting the approval of the Contracting Officer or designated representative.

#### **1.05 HAUL ROUTE AND PROJECT ACCESS AND BORROW SITES**

- A. Project access shall be as designated by the Installation. Contractor shall use the Gates designated by the Installation. Haul routes and waste area shall be designated by the Installation. Contractor shall assume that there are no borrow or waste sites available in the Installation.

#### **1.06 EXISTING OVERHEAD OR UNDERGROUND WORK**

- A. All existing overhead and underground work is not indicated on drawings. Proposers shall make their own investigations of the site prior to submitting their proposals, and shall fully inform themselves regarding all pertinent conditions.
- B. Carefully check the site and building where the work of this contract is to be placed and observe all existing overhead wires and equipment. All such work shall be protected, as required, whether or not shown on the drawings.

- C. Attention is directed to the existence of pipe and other underground utility improvements which occur at the site. These include storm sewer, sanitary sewer, water, electrical, gas, telephone, and fiber optic communications lines. All reasonable precautions shall be taken to preserve and protect all such improvements, whether or not shown on the drawings. Contact line locators and Post engineering for information on site utilities. An excavation permit, issued by the Installation, is required prior to the Contractor commencing any excavation work. Obtain all required permits from Federal and State agencies having jurisdiction. Include time required to obtain these permits in scheduling activities on site. No extra time will be granted after the Notice to Proceed is issued for obtaining permits.
- D. Exercise extreme care in locating and identifying these utility lines before beginning any work in adjacent areas.

### **1.07 GAS SERVICE**

- A. Extension of capped off gas service at interior of building will be required as part of the work of this project.

### **1.08 INTERRUPTION OF EXISTING UTILITIES SERVICES**

- A. The GC shall perform the work under this Contract with a minimum of outage time for all utilities. Interruption of service shall be coordinated with the appropriate Utility. In some cases, the GC may be required to perform the work while the existing utility is in service. The existing utilities services may be interrupted only when approved by the Post. When it is necessary to interrupt the existing utilities, the GC shall notify the Post Civil Engineering Office in writing at least 14 days in advance of the time desired for the existing service to be interrupted. The interruption time shall be kept to a minimum. The amount of time requested by the GC for interruption of existing utility services shall be as approved by the Post Civil Engineering Office. All interruptions of existing utilities shall be coordinated by the GC through the Post Civil Engineering Office.

### **1.09 EXCAVATION**

- A. Excavation work is required in relation to plumbing waste items..

### **1.10 SAFETY REQUIREMENTS**

- A. Standards: Maintain project in accordance with the following safety and insurance standards:
  - 1. The Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, dated October 1992, as referred to in the General Provisions, paragraph 31, "ACCIDENT PREVENTION".
- B. O.S.H.A. (OSHA) Standards:
  - 1. The General Contractor (GC) will be expected to comply with OSHA Standards. The OSHA Standards are subject to change and such changes may affect the GC in his performance under the contract. It is the GC's responsibility to know such changes and effective dates of changes.
- C. Hazards Control:

1. All hazardous waste generated by this construction activity defined by the Resource Conservation and Recovery Act shall remain the property of the Contractor or his subcontractors, and must be stored, transported, and disposed of in accordance with the requirements of all applicable laws and regulations.
  2. Removal or disposal of toxic materials or asbestos is not included in this contract. If the Contractor encounters such materials, he shall stop work and notify the Contracting Officer or designated representative immediately.
- D. Submittals: The General Contractor shall provide a Safety Plan and a Job Hazard Analysis for the Contracting Officer or designated representative's review prior to beginning construction activities.

### **1.11 WELDING**

- A. Prior to commencing any welding, the GC shall obtain a welding permit from the Post Fire Department. Also permits are required for all "chop saw" work with metals.

### **1.12 BARRICADES AND WARNING DEVICES**

- A. The GC shall provide and maintain barricades and lighting devices, in accordance with manual for uniform traffic control devices in the Georgia Department of Transportation Manual, current Edition, at all points of excavation and construction within perimeter of construction site. Conform to all OSHA requirements for personnel safety.

### **1.13 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. Insure that no open containers or spills of combustible substances are present.
  3. Insure that ignition is not possible by conduction, convection, radiation, or dispersion of molten metal.
- B. Proper protection equipment and practices will be used, i.e., fire-resistant blankets, wetting or surrounding area, removal of combustible materials where practicable, earth filled backing, portable fire extinguishers of proper type on hand.
- C. When open flame devices are to be used, a permit is required and notification to the Installation Fire Department is required.

### **1.14 FIRE PROTECTION**

- A. The GC shall at all times maintain good housekeeping practices to reduce the risk of the 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.
- B. Suitable storage space shall be provided outside the immediate 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 when not in use.
- C. A fire extinguisher shall be available 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 workman are not on the premises.

- D. The GC shall provide fire extinguishers in accordance with the recommendations of NFPA Nos. 10 and 241. However, a minimum of two fire extinguishers shall be available for the building during the construction period.
- E. Fire Codes: The GC shall obey all requirements of the national fire codes, installation fire regulations, and the UFC 3-600-01 manual as they relate to the work on this project.

### **1.15 WORK BY OTHERS**

- 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 AAFES (AF/AI).
  - 3. Any work indicated to be furnished and installed by the AAFES Vendors or Concessionaires.

### **1.16 AAFES-FURNISHED AND AAFES-INSTALLED EQUIPMENT (AF/AI)**

- A. Attention is called to the GENERAL PROVISIONS concerning work by others under separate Contract. The following items will be furnished and installed by AAFES under separate contracts during the GC's performance period:
  - 1. Flat Screen Monitors.
  - 2. Cash registers, Point of Sale counters (Electrical service by GC)
  - 3. Smallware Package.
  - 4. Walk-in freezers and coolers.
  - 5. Signage designated as "AF/AI"
  - 6. Snack Avenue Counters/equipment.
  - 7. Shelving and display and storage units.
  - 8. Office furniture and equipment.
- B. At the Contracting Officer or designated representative's option, additional equipment will be furnished and/or installed.

### **1.17 AAFES FURNISHED-CONTRACTOR INSTALLED ITEMS (AF/CI)**

- A. AAFES shall furnish and install certain items/equipment as indicated on the plans. AAFES furnished items will be received at the job site by a representative of the local exchange. The G.C. will provide power and plumbing to all units and final hook-up of power and plumbing at all required locations, including walk-in cooler/ freezer.
- B. The GC shall construct all openings, furnish and install required sleeves, and furnish and install all reinforcing miscellaneous supports, angles, plates, anchors, and bolts, cover plates and fitments necessary to secure AAFES-furnished equipment in place.
- C. The GC shall include in the Construction Schedule, dates for which the AAFES-furnished items will be required on the site. AAFES requires these dates within 15 days of award of contract.
- D. If the GC subsequently requests a change to the delivery date, the Contracting Officer or designated representative will use his reasonable best efforts to effect the change. Any request must be made at least thirty (30) days in advance of the scheduled delivery date, and must be in writing. Failure to provide this notice, or if provided, inability of the Contracting Officer or designated representative to effect the change for any reason shall

not constitute a basis for a claim under the Contract to store, protect, and install the AF/CI equipment.

#### **1.18 LINING OF JOINTS IN FINISHED MATERIALS**

- A. It shall be the responsibility of the GC to make certain in the installation of jointed floor, wall, and ceiling 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 are symmetrically placed wherever possible. This includes heating registers, light fixtures, paneling, 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 GC shall meet the Contracting Officer or designated representative to determine the most satisfactory arrangement. The GC shall establish center lines for all trades.

#### **1.19 INTEGRATING EXISTING WORK**

- A. All existing streets, the building where the work occurs, adjacent buildings, and other improvements shall be protected from damage.
- B. The GC's operations shall be confined to the immediate vicinity of the new work and shall not in any way interfere with or obstruct the ingress or egress to and from street or adjacent property.
- C. Where 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 AAFES.

#### **1.20 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 6'-9" without written consent from the Contracting Officer or designated representative. Where piping or conduit is left exposed within a room, it shall be true to plumb or horizontal and parallel to the walls. Where possible, uniform margins are to be maintained between parallel lines and/or adjacent wall, floor, or ceiling surfaces.

#### **1.21 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 by the GC, to the satisfaction of the Contracting Officer or designated representative and the Post Civil Engineer Office. All utility lines on under streets shall be jacked and bored, not trenched.

#### **1.22 LOCATION OF EQUIPMENT AND PIPING**

- A. Drawings showing location of equipment, piping, ductwork, etc., are diagrammatic and job conditions do not always permit their installation in the location shown. When this situation occurs, it shall be brought to the Contracting Officer or designated representative's attention immediately and the new location determined in a joint conference. Installation in and between framing members is required. The GC will be held responsible for any additional cost of installation in a new location. Items relocated without the approval of the Contracting Officer or designated representative may require relocation. The GC shall remove and relocate such items at his own expense if so directed by the Contracting Officer or designated representative.

### **1.23 OVERLOADING**

- A. The GC shall be responsible for not overloading any part or parts of structures beyond their safe calculated carrying capacities during construction 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.

### **1.24 STANDARDS**

- A. Any materials 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 national 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 amendment thereto.
  - 3. Where Commercial Standards are referred to as a measure of quality, standard, and method of fabrication, they refer to Commercial Standards, 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.

### **1.25 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 test for such items. Such certificates shall be furnished to the Contracting Officer or designated representative for all items so specified.

### **1.26 OCCUPANCY BY AAFES**

- A. AAFES 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 AAFES and its own Contractors in the endeavor.

### **1.27 AAFES CONTRACTS**

- A. The GC's attention is called to General Provision titled, "Other Contracts", and provision titled "Final Inspection and Acceptance", paragraph referring to "use and possession prior

to completion", the AAFES plans to install equipment in the following areas as noted below prior to completion date:

<u>DESCRIPTION</u>	<u>DAYS PRIOR TO CONTRACT COMPLETION DATE</u>
AAFES Start Installation of Snack Avenue Fixtures	30 Days

### 1.28 TESTS AND REPORTS

- A. **NOT USED.**

### 1.29 GUARANTEE AND EXTENDED GUARANTEE

- A. Upon completion of project, prior to final payment, guarantees required by technical division of specifications shall be properly executed in quadruplicate by subcontractors and submitted to the Contracting Officer or designated representative. Delivery of guarantees shall not relieve the GC from any obligation assumed under the Contract.
- B. Submit guarantee covering entire project for one year. In addition, where separate guarantees for certain portions of work are for longer periods, the GC's guarantee shall be extended to cover such longer periods. Copies of the guarantees shall be inserted into the Maintenance Manuals. In cases where the manufacturer's standard commercial warranty (i.e., roofing systems, mechanical components, hardware, etc.) is longer than one year, standard commercial warranty period shall be provided.
- C. Guarantee shall become valid and operative upon acceptance by AAFES.

### 1.30 REFERENCES

- A. All references to the word "Government" in the specifications shall mean Army and Air Force Exchange Service (AAFES), except guarantees which shall be "Government".
- B. Wherever the term "Not in Mechanical Contract" (NIMC) or the term "Not in Electrical Contract" (NIEC) is used in the specifications and on the drawings, it shall be interpreted to mean that the work is not a part of the particular sub-trade BUT IS INCLUDED under some other trade of the Contract. Wherever the term "Not in Contract" (NIC) is used, it shall be interpreted to mean that the item of work is not a part of the Contract, except as may be otherwise noted.
- C. Definitions:
  - 1. Vendor: Person or persons selling any material item.
  - 2. Installation: Military facility where the project is being built.
  - 3. Concessionaire: Person who is directly responsible for operation of the concessions.
  - 4. Architect-Engineer: That person or firm responsible for preparing the contract drawings and specifications.
  - 5. AAFES or Exchange: Army and Air Force Exchange Service.
  - 6. Inspection Agency: AAFES, Project Manager.
  - 7. Installation/Facility Engineers: Responsible installation engineer.

### 1.31 SUBMISSION OF PHOTOGRAPHS

- A. The GC shall submit to the Contracting Officer or designated representative photographs taken on or about the first of every month, showing the general conditions of work as viewed from the north, south, east, west. Photographs (digital) must accompany each Application for Payment. Each picture shall be identified by date of exposure, project title, description of content, and AAFES Project Number.

**1.32 NORMAL ACTIVITIES AND ENVIRONMENTAL CONDITIONS FOR FT. STEWART, GEORGIA**

- A. Ft. Stewart does not allow burning. Do not burn anything on site.
- B. At times force protection and national security requirements may mean that the Contractor will not be able to access the Post or that access will be delayed. These are normal activities for Ft. Stewart and the Contractor shall expect that construction activities may be impacted as a result of Ft. Stewart normal activities.

**1.33 INFORMATION PROCEDURES DURING CONSTRUCTION (RFI's)**

- A. It is recognized that technical questions will arise during the course of the construction of this project. Contractor shall endeavor to handle these questions in a logical and consistent manner. The preferred method is with RFI's e-mailed to the A/E for action.

**1.34 POSTING OF AMENDMENTS AND CHANGE ORDERS**

- A. Contractor shall post all amendments, field orders, and change orders in the Contract drawings and specifications such that they are available for reference at all times on the project site.

**1.35 PRICE CHANGES IN MATERIALS AND EQUIPMENT SUBSEQUENT TO BIDDING**

- A. The Contractor shall place orders for all systems, materials, and equipment in the project at the earliest possible time. His base bid price is to include what he projects any escalating costs will be. No allowance for increases to the Contract Award Amount will be allowed for systems, materials, and equipment not ordered in a timely fashion. Credit will be allowed for stored materials provided they are identified specifically for use in this project and are stored on site or in a bonded warehouse. AAFES reserves the right to verify all stored materials.

**PART 2 PRODUCTS – NOT USED**

**PART 3 EXECUTION – NOT USED**

**END OF SECTION**

## SECTION 01045

### CUTTING AND PATCHING

#### PART 1 GENERAL

##### 1.01 DESCRIPTION

- A. Related Requirements Specified Elsewhere:
  - 1. Summary of the Work: Section 01010.
  - 2. Concrete Sections: Division 3
  - 3. Mechanical: Division 15.
  - 4. Electrical: Division 16.
- B. Execute cutting (including excavating), fitting or patching, or work required to:
  - 1. Install new work.
  - 2. Uncover work to provide for installation of ill-timed work.
  - 3. Remove and replace defective work.
  - 4. Remove and replace work not conforming to requirements of Contract Documents.
  - 5. Remove samples of installed work as specified for testing.
- C. In addition to contract requirements, upon written instruction of the Contracting Officer or designated representative:
  - 1. Uncover work to provide for Contracting Officer or designated representative's observation of covered work.
  - 2. Remove samples of installed materials for testing.
  - 3. Remove work to provide for alteration of existing work.
- D. Do not endanger any work by cutting or altering work or any part of it.
- E. Do not cut or alter work of another contractor without written consent of the Contracting Officer or designated representative.

##### 1.02 SUBMITTALS

- A. Prior to cutting which affects structural safety of project, submit written notice to the Contracting Officer or designated representative, requesting consent to proceed with cutting, including:
  - 1. Identification of project.
  - 2. Description of affected work.
  - 3. Necessity for cutting.
  - 4. Affect on other work, on structural integrity of project.
  - 5. Description of proposed work. Designate:
    - a. Scope of cutting and patching.
    - b. Trades to execute work.
    - c. Products proposed to be used.
    - d. Extent of refinishing.
  - 6. Photographs of affected work.
- B. Submit written notice to the Contracting Officer or designated representative designating time-work will be uncovered to provide for observation.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Materials for replacement of work removed: Comply with specifications for type of work to be done.

## **PART 3 EXECUTION**

### **3.01 INSPECTION**

- A. Inspect existing conditions of work including elements subject to movement or damage during:
  - 1. Cutting and patching.
  - 2. Excavating and backfilling.
- B. After uncovering work, inspect conditions affecting installation of new products.

### **3.02 PREPARATION, PRIOR TO CUTTING**

- A. Provide shoring, bracing and support as required to maintain structural integrity of the project.

### **3.03 PERFORMANCE**

- A. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances and finishes.
- B. Execute cutting and demolition by methods which will prevent damage to other work and will provide proper surfaces to receive installation of repairs and new work.
- C. Restore work which has been cut or removed; install new products to provide complete work in accordance with requirements of Contract Documents.
- D. Refinish entire surfaces as necessary to provide an even finish.
  - 1. Continuous surfaces: To nearest intersections.
  - 2. Assembly: entire refinishing.

**END OF SECTION**

## SECTION 01220

### PROGRESS MEETINGS

#### PART 1 - GENERAL

##### 1.01 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Summary of the Work: Section 01010.
- B. Submittals: Section 01300.
- C. Project Record Documents: Section 01720.

##### 1.02 PROGRESS MEETINGS - GENERAL CONTRACTOR'S (GC) RESPONSIBILITY

- A. Prepare agendas.
- B. Make physical arrangements for meetings.
- C. Preside at meetings.
- D. Project Manager will record minutes; including significant proceedings and decisions.
- E. Distribute copies of minutes to participants, within four (4) days after meetings.
- F. Furnish four (4) copies of minutes of Contracting Officer or designated representative.

##### 1.03 ATTENDANCE

- A. The Contracting Officer or designated representative will attend meetings to ascertain that work is expedited consistent with construction schedule and with Contract Documents.

##### 1.04 PRE-CONSTRUCTION MEETING

- A. Date schedule by the Contracting Officer or designated representative.
- B. Attendance:
  - 1. AAFES Representative.
  - 2. Contracting Officer or designated representative and his consultants.
    - a. Representatives of Governmental or other Regulatory Agencies. This includes representatives of the Installation.
    - b. General Contractor and his major subcontractors.
- C. Minimum Agenda:
  - 1. Distribute and discuss:
    - a. List of major subcontractors.
    - b. Tentative Construction Schedule.
    - c. Critical work sequencing.
    - d. Designation of responsible personnel.
    - e. Processing of field decisions and Change Orders.
    - f. Adequacy of distribution of Contract Documents.
    - g. Submittal of shop drawings, project data and samples.
    - h. Procedures for maintaining Record Documents.
    - i. Use of premises:
      - 1) Office and storage areas.
      - 2) AAFES requirements.
    - j. Major equipment deliveries and priorities.
    - k. Safety and first aid procedures.
    - l. Security procedures.
    - m. Housekeeping procedures.

## **1.05 PROGRESS MEETINGS**

- A. Schedule meetings as determined by the GC and Contracting Officer or designated representative.
- B. Hold called meetings as progress of work dictates (minimum 1 every month).
- C. Location of Meetings: Job Site or as directed in notice.
- D. Attendance:
  - 1. Contracting Officer or designated representative.
  - 2. Subcontractors as pertinent to agenda.
  - 3. Safety Representative.
  - 4. Representative of Post "CIVIL ENGINEERING OFFICE" at the Installation).
  - 5. Minimum Agenda.
    - a. Review, approve minutes of previous meeting.
    - b. Review, work progress since last meeting.
    - c. Note field observations, problems, and decisions.
    - d. Identify problems which impede planned progress.
    - e. Review off-site fabrication problems.
    - f. Develop corrective measures and procedures to regain planned schedule.
    - g. Revise Construction Schedule as indicated.
    - h. Plan progress during next work period.
    - i. Review submittal schedules, expedite as required to maintain schedule.
    - j. Maintain quality and work standards.
    - k. Review changes proposed by AAFES for:
      - 1) Affect on Construction Schedule.
      - 2) Affect on completion date.
    - l. Complete other current business.

**END OF SECTION**

## SECTION 01300

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.01 GENERAL

- A. Submit, to the Contracting Officer or designated representative, shop drawings, project data, and samples required by specification sections.
  - 1. Exclusive of submittals for exterior submittals, Contractor at his option may elect to make a written statement saying that an item being considered for use on the project meets the Contract requirements and is named specifically and completely identified in lieu of making a formal shop drawing submittal. Use AAFES form 4450-48 for all submittals. A submittal identifying the material or system being proposed, shall be made from each item so named in lieu of a formal submittal.
- B. Submit, to the Installation copies of all submittals involving exterior materials. Installation has approval authority over all exterior materials. Make the submittals to Installation directly at same time as submittals to Contracting Officer or designated representative. Procurement and/or installation of all such materials without written approval by the Installation is at the Contractor's risk and if such materials are rejected by the Installation all costs associated with said materials shall be borne by the G.C.
- C. Related Requirements Specified Elsewhere:
  - 1. General Provisions and Amendments.
  - 2. Section 01720 - Project Record and Closeout Documents.
- D. Prepare and submit with the Construction Schedule a separate schedule listing dates for submission and dates to review shop drawings, project data, and samples that will be needed for each product.
- E. By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
  - 1. Contractor shall coordinate voltages and other requirements of equipment supplied with requirements of the Work and of the Contract Documents.

##### 1.02 SHOP DRAWINGS

- A. Definition: Original drawings, prepared by the general contractor (GC), subcontractor, supplier, or distributor which illustrate some portion of the work; showing fabrication, layout, setting or erection details and coordination with work by others.
  - 1. Prepared by a qualified detailer.
  - 2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
  - 3. Minimum Sheet Size: 8-1/2 inches by 11 inches
  - 4. Reproductions for Submittals: Opaque diazo or Xerox prints

##### 1.03 PRODUCT DATA

- A. Manufacturer's Standard Schematic Drawings:
  - 1. Modify drawings to delete information which is not applicable to project.
  - 2. Supplement standard information to provide additional information applicable to project.
- B. Manufacturer's catalogue sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data.

1. Clearly mark each copy to identify pertinent materials, products, or models.
  2. Show dimensions and clearances required.
  3. Show performance characteristics and capacities.
- C. Asbestos-Free Product/Material: Prior to the approval of the product/material to be used, the manufacturer/supplier shall provide written certifications that the product/material contains no asbestos. These certifications are mandatory before approval will be issued. Submittals furnished without asbestos-free certification will be returned to the Contractor with no action taken until such certification is provided.
- D. Lead-Free Paint: Manufacturers/suppliers of paint shall provide written certifications that the products submitted contain no lead. These certifications are mandatory before approval will be issued. Submittals furnished without lead-free certification will be returned to the Contractor with no action taken until such certification is provided.

#### **1.04 SAMPLES**

- A. Physical examples to illustrate materials, equipment or workmanship, and to establish standards by which completed work is judged.
- B. Office Samples: Of sufficient size and quantity to clearly illustrate:
1. Functional characteristics of product or material, with integrally related parts and attachments.
  2. Full range of color samples.
  3. After review, samples may be used in construction of project unless otherwise noted.

#### **1.05 CONTRACTOR RESPONSIBILITIES**

- A. See: General Conditions and Amendments.
- B. The GC is responsible for the timely submittal of all complete and coordinated shop drawings and samples. No allowance will be made for time lost due to delinquent or incomplete submittals by the GC.
- C. SPECIAL NOTE: All submittals requiring color selection/coordination for exterior materials shall be submitted at the same time.
- D. SUBMITTAL SCHEDULE: The Contractor shall provide a submittal schedule listing submittal requirements for each section of the specifications. List shall indicate what Contractor is to submit to the Contracting Officer or designated representative for approval and/or concurrence.

#### **1.06 SUBMISSION REQUIREMENTS**

- A. Schedule submissions at least 14 days before dates reviewed submittals will be needed, but in no case will submittals be made beyond 60 days after award of contract except by permission of Contracting Officer or designated representative.
- B. Submit number of copies of shop drawings, project data, and samples which GC requires for distribution plus two (2) copies which will be retained by the Contracting Officer's Representative. Also, submit one copy of each exterior material submittal directly to the Installation concurrently with submittal to the Contracting Officer or designated representative.
- C. Submit number of samples specified in each specifications section or as required by the Contracting Officer or designated representative.
- D. Accompany submittals with transmittal letter, in duplicate, containing:
1. Date.
  2. Project title and number.
  3. GC's name and address.

4. The number of each shop drawing, project data, and sample submitted.
  5. Notification of deviations from Contract Documents. If no specific mention of such deviation is made, the GC will not be relieved of the responsibility for completing the work in full accordance with the Contract Documents even though such drawings are approved by the Contracting Officer or designated representative.
  6. Other pertinent data.
- E. Submittals shall include:
1. Date and revision dates.
  2. Project title and number.
  3. The name of:
    - a. Architect/Engineer
    - b. Contractor
    - c. Subcontractor
    - d. Supplier
    - e. Manufacturer
    - f. Separate detailer when pertinent
  4. Identification of product or material.
  5. Relation to adjacent structure or materials.
  6. Field dimensions, clearly identified as such.
  7. Specification section number.
  8. Applicable standards, such as ASTM number of Federal Specifications.
  9. Identification of deviations from Contract Documents.
  10. GC's stamp, initialed or signed, certifying to review of submittal, verification of field measurements, and compliance with Contract Documents.

#### **1.07 RESUBMISSION REQUIREMENTS**

- A. Shop Drawings:
1. Revise initial drawings as required and resubmit as specified for initial submittal.
  2. Indicate on drawings any changes which have been made other than those requested by the Contracting Officer or designated representative.
- B. Project Data and Samples:
1. Submit new data and samples as required for initial submittal.

#### **PART 2 PRODUCTS – NOT USED**

#### **PART 3 EXECUTION – NOT USED**

**END OF SECTION**

**SECTION 01400**

**QUALITY CONTROL**

**PART 1 - GENERAL**

**1.01 REQUIREMENTS INCLUDED**

- A. The General Contractor shall establish a quality control system to perform sufficient inspection and tests of all items of work, including that of his subcontractor(s) to insure conformation to applicable specifications and drawings with respect to the materials, workmanship, construction, finish and functional performance. General Contractor is responsible for the quality of the work of the G.C.'s organization and the work of all his subcontractors. Tests of materials and/or special inspections will be made, when required by these specifications, by applicable law, rules and regulations in accordance with respective Sections of the specifications. Where required, the General Contractor shall employ and pay for the services of an independent agency to perform specific services and testing. Examples of such services are test and balance for HVAC, tests of fill materials, tests of concrete materials, concrete mix design, masonry mortar, asphalt concrete, laboratory testing of materials proposed and calculations for asphalt concrete mixtures.
- B. General Contractor shall arrange and pay for all services and testing which are not specifically indicated to be provided by AAFES. All testing laboratories used shall be approved by the Government.
- C. If a material is not required to be field tested, the Contracting Officer or designated representative 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 General Contractor 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 General Contractor, at his own expense, shall replace work or material removed and repair all work disturbed thereby.
- E. The Testing Agency shall report results of all tests in writing simultaneously to the following:
  - 1. Contracting Officer: 3 copies
  - 2. Site Inspector: 1 copy
  - 3. General Contractor: 1 copy
  - 4. Architect/Engineer: 1 copy
- F. Reports shall state that tests were made under responsible charge of a Testing Engineer, holding a license to operate in the State where the project is being constructed, and that material or materials were tested in accordance with provisions of these specifications, and that material and/or materials tested, passed or failed to pass such requirements.

**1.02 CONTRACTOR'S RESPONSIBILITIES**

- A. Cooperate with the Contracting Officer or designated representative and laboratory personnel and provide access to work and to manufacturer's operations. Provide samples of materials to be tested, in required quantities. Furnish casual 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 Laboratory's exclusive use for storage and curing of test samples. Notify Laboratory sufficiently in advance of operations to allow for its assignment of personnel and scheduling of tests.

- B. The use of the General Contractor's independent testing services shall in no way relieve the General Contractor of his responsibility to furnish materials and construction in full compliance with the plans and specifications.
- C. The General Contractor shall coordinate with 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.
- D. Upon completion of the project the General Contractor shall submit a signed 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.

### **1.03 RELATED REQUIREMENTS**

- A. Required Submittals: Section 01300.
- B. Related requirements and tests specified in Sections 2 through 16.

**END OF SECTION**

## SECTION 01420

### 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 sections of Division 2.

##### 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, Archeological 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 AAFES 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 AAFES (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 AAFES CONTRACTS.**

- A. For equipment used in the performance of this contract, Contractor shall obtain in Contractor's name and at no additional expense to AAFES, 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, coordinations, 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 AAFES will be submitted by AAFES, 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) \_\_\_\_\_, \*  
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 (Section 02110). 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 & WASTE DISPOSAL**

- 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 Telecopier 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 if 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 AAFES, the installation, and the Contractor.
  2. Notwithstanding any other clause in this contract, including but not limited to all standard site work general provisions (Sections 02010 - 02950); 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 DEFINITONS**

- 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 archeological 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 AAFES 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 AAFES 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 01500

### TEMPORARY FACILITIES AND CONTROLS

#### PART 1 - GENERAL

##### 1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Cleaning: Section 01710
- B. Plumbing: Division 15
- C. Electrical: Division 16
- D. All temporary facilities and controls must comply with NFPA 241 and EM-385-1-1 and UFC 3-600-1, section 1-7.

##### 1.02 ELECTRICAL SYSTEM

- A. Furnish and install temporary electric power service for construction needs throughout the construction period.
  - 1. Electric Services: Provide a complete temporary electric service including all secondary wiring, supports, switches, over-current protection, metering, receptacles, etc., required for a 120/208-volt, 3-phase, 4-wire, 200 amp service for the construction of the building. The electrical contractor shall be responsible to furnish all fused cutouts, transformers, primary and secondary conductors, disconnects, and miscellaneous hardware.
  - 2. Power center for miscellaneous tools and equipment used in construction work.
    - a. Provide 120 volt and 208 volt receptacles for use by all trades. Each outlet shall have a circuit breaker. Outlets shall be located so that no extensions are more than 100 feet long. All outlets shall be grounded.
    - b. Users shall provide grounded, Underwriters' Laboratories approved extension cords from power center to point of operations.
  - 3. Power for temporary light.
    - a. Provide and maintain a temporary lighting system with guarded lighting sockets and lamps throughout the building to provide temporary lighting to satisfy construction requirements, in such areas and at such times that day lighting is inadequate. Provide at least 0.7 watts of incandescent lighting per square foot and maintain a socket voltage of at least 100 volts. Use at least 100-watt lamps. In any event, the lighting intensity shall no be less than five (5) foot-candles in the vicinity of work and traffic areas.
- B. Capacity
  - 1. Adequate electrical service for construction use by all trades during construction period.
  - 2. Unusually heavy loads, such as welding, and other equipment with special power requirements, will not be connected to the system.
- C. Maintain strict supervision of use of temporary services.
  - 1. Enforce conformance with applicable standards.
  - 2. Enforce safe practices.
  - 3. Prevent abuse of services.
  - 4. Use of temporary electrical service for resistance heating is not permitted.
- D. The temporary electrical service for construction shall comply with the latest editions of the Occupational Safety and Health Standards and the National Electric Code, NFPA-70.

### **1.03 WATER SERVICE**

- A. Water shall be furnished from existing water supply (hose bibb, if available) outside the building.
- B. Maintain strict supervision of use of existing services.
  - 1. Enforce conformance with applicable codes and standards.
  - 2. Enforce sanitary practices.
  - 3. Prevent abuse of services.
  - 4. Prevent wasteful use of water.
  - 5. Protect system from freezing.

### **1.04 TELEPHONE/COMMUNICATIONS**

- A. General Contractor to provide phone communication.

### **1.05 TOILET FACILITIES**

- A. Furnish and install adequate portable chemical toilets.
- B. Provide maintenance service to keep the toilet clean and sanitary.

### **1.06 HEAT AND VENTILATION**

- A. Furnish and install temporary heat and ventilation in enclosed new construction areas throughout the construction period to facilitate progress of work, protect work against dampness and cold, prevent moisture condensation on surfaces, and provide suitable ambient temperatures and humidity levels for installation and curing of materials with the following requirements:
  - 1. Twenty-four (24) hours a day during placing, setting, and curing of cementitious materials with a temperature as required by the specification section for each product (minimum temperature: 40°F).
  - 2. Twenty-four (24) hours a day, seven days prior to, and during, placing of interior finishes; woodwork, resilient floors, painting and finishing: as required by specification section for each product.
  - 3. Twenty-four (24) hours a day after application of finishes, and until substantial completion: minimum 65°F, 18°C.
  - 4. As required in the specifications for each product for storage of materials.
- B. Ventilation Required
  - 1. General: Prevent hazardous accumulations of dust, fumes, mists, vapors or gases in areas occupied during construction.
    - a. Provide local exhaust ventilation to prevent harmful dispersal of hazardous substances into atmosphere of occupied areas.
    - b. Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
    - c. Ventilate storage spaces containing hazardous or volatile materials.
  - 2. Provide adequate ventilation for:
    - a. Curing installed materials.
    - b. Dispersal of humidity.
    - c. Ventilation of temporary sanitary facilities.

3. Duration of operations:
  - a. For personnel:
    - 1) At all times when the General Contractor's personnel and/or AAFES employees or customers occupy an area and are subject to hazardous accumulation of harmful elements.
    - 2) Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.
  - b. For curing installed materials: as required by specification Section for respective materials.
  - c. For humidity dispersal: as needed to provide suitable ambient conditions for work.
  - d. Use of permanent heating and ventilating equipment:
    - 1) The General Contractor shall take precautions as required to prevent damage to the equipment. All filters must be in place.
    - 2) The General Contractor shall be responsible for maintaining clean filters in all equipment and shall install new filters when the Government takes occupancy of the building.
  - e. Beneficial Occupancy: During the period of beneficial occupancy by AAFES, the HVAC systems must be operating under the design and performance standards of the completed permanent design requirements.
  - f. The General Contractor shall maintain strict supervision of operation of all equipment used for temporary heating and ventilating as follows:
    - 1) Enforce conformance with applicable codes and standards.
    - 2) Enforce safe practices.
    - 3) Prevent abuse of services.
    - 4) Prevent damage to finishes.

#### **1.07 COSTS OF TEMPORARY UTILITIES (Water and electric power)**

- A. The General Contractor shall pay all costs involved with the installation, use, maintenance and removal of temporary utilities.
- B. The General Contractor shall pay all costs involved with the installation, and maintenance of all permanent building systems until occupancy by AAFES.
- C. The General Contractor will be responsible for installation of temporary meters prior to commencing work. Cost for use of utilities will be paid for by the General Contractor. Use of utilities shall be in accordance with General Provisions titled "Availability and use of Utility Services". Fire hydrants will not be used to obtain water for this project. Electricity will not be used for electric resistance heating.

#### **1.08 TEMPORARY CONSTRUCTION, EQUIPMENT AND PROTECTION**

- A. Provide, maintain and remove upon completion of the work, all temporary rigging, scaffolding, hoisting equipment, ladders to roof, barricades around openings, and all other temporary work as required to complete all work of the Contract. The General Contractor shall coordinate the use and furnishing of scaffolds with his subcontractors.
- B. Provide, maintain and remove upon completion of the work, or sooner if authorized by the Contracting Officer or designated representative, all fences, barricades, lights, shoring, pedestrian walkways, and other protective structures or devices necessary for the safety of workmen, AAFES employees, equipment, the public, and property.
- C. All temporary construction and equipment shall conform to all regulations, ordinances, laws and other requirements of the authorities having jurisdiction, including insurance companies, with regard to safety precautions, operation and fire hazard.

- D. Pumping: Provide and maintain pumping facilities, including power, for keeping the site, excavations and structures free of accumulations of water at all times, whether from underground seepage, rainfall, drainage or broken lines.
- E. Unauthorized Entry: Maintain provision for closing and locking the building as soon as possible. Existing structures to be expanded must remain secure. When exterior work is in process such as concrete finish work, bituminous paving and landscaping work, the General Contractor shall maintain a night watchman on the premises until such time that the work cannot be harmed or damaged.
- F. Damage or Theft: Protect the work and material to be used on the project, from damages or loss due to the elements, theft, vandalism, malicious mischief, or other causes. The General Contractor shall be held responsible for such damages, or loss, which he shall remedy at his expense.
- G. Temporary Walls, Closures, Security Enclosures, temporary chain link fence and Barricades: Provide and maintain all barricades or enclosures shown on the drawings and described in Section 01010 required to protect the work in progress from outside elements, dust, interior construction dust and noise, and other disturbances as a result of work under this Contract. Such protection shall be positive, shall meet the approval of the Contracting Officer or designated representative, and shall be maintained for the duration of the construction period or as required to provide for the protection as specified.

#### **1.09 PROJECT BULLETIN BOARD**

- A. The General Contractor shall furnish, install, and maintain, during the life of the project, a weathertight bulletin board approximately 3 feet high by 5 feet wide, having not less than two hinged or sliding glass doors with provisions for locking. The bulletin board shall be mounted where and as approved by the Contracting Officer or designated representative, in a prominent place accessible to all employees of the General Contractor and subcontractors, and to applicants for employment. The bulletin board shall remain the property of the General Contractor and shall be removed by him upon completion of the Contract work. The following information which will be furnished by the government to the General Contractor (except safety posters) shall be posted on the bulletin board and shall be maintained by the General Contractor in easily, readable condition at all times for the duration of the Contract:
  - 1. The Equal Employment Opportunity Post and Notice of Non-discrimination of Employment (Standard Form 38).
  - 2. Wage Rate Information Poster (Form SOL 155), with the contract schedule of minimum rates as required by the Davis-Bacon Act.
  - 3. Safety posters.

**END OF SECTION**

## SECTION 01520

### CONSTRUCTION PROGRESS SCHEDULE

#### PART 1 - GENERAL

##### 1.01 GENERAL

- A. The construction progress schedule shall be prepared by the General Contractor and shall consist of a bar chart utilizing Critical Path Method (CPM) scheduling. In preparing this construction progress schedule, the scheduling of construction shall be the responsibility of the General Contractor and shall be developed in accordance with the phasing plan shown on the construction drawings. The requirement for the schedule is included to assure adequate planning and execution of the work and to assist the Contracting Officer or designated representative in evaluating progress of the work.
- B. Provide projected construction schedules for entire work, updated monthly.

##### 1.02 RELATED SECTIONS

- A. Summary of The Work: Section 01010.
- B. Progress Meetings: Section 01220.
- C. Submittals: Section 01300.

##### 1.03 SCOPE

- A. The General Contractor shall prepare a Construction Progress Schedule to serve as a guide in managing the construction progress. Reference General Provisions clause titled, "Schedule and Progress".
- B. Schedule format shall be prepared utilizing the Critical Path Method (CPM) such as to enable the Contracting Officer or designated representative to evaluate the reasonableness of the proposal schedule, and to determine if the actual construction is on schedule.

##### 1.04 CONSTRUCTION PROGRESS SCHEDULE

- A. The schedule consists of keeping a record of the time allotted for each activity and the actual progress of the activity.
- B. Activities shall be listed vertically and shall include the units of work required for the project.
- C. All activities of AAFES which affect progress and Contract required dates for completion shall be shown. Include activities for AAFES - furnished/AAFES - installed items.
- D. The selection and number of activities shall be subject to the Contracting Officer or designated representative's approval.
- E. Activities listed will be the same as those used for progress payments.

##### 1.05 A SCALE OF TIME

- A. A scale of time, from date of the beginning of the Contract work to the date of completion of the Contract work, shall be indicated horizontally on the chart. The units of time indicated shall be calendar days.

##### 1.06 ACTIVITY TIMES

- A. Activity shall be indicated in the form of scaled time bars. The bars shall indicate the following:
  - 1. The schedule of time allotted for the activity.

2. The actual progress of the activity including the actual time of the activity start, the time spent to date or to the finish of the activity.

### **1.07 SUBMISSION AND APPROVAL**

- A. Submission and approval of the construction progress schedule shall be as follows:
  1. A preliminary bar chart defining the General Contractor's planned operations during the first thirty (30) calendar days after notice-to-proceed will be submitted within ten (10) days. The General Contractor's general approach for the balance of the project shall be indicated. Cost of activities expected to be completed or partially completed before submission and approval of the complete bar chart could be included.

### **1.08 THE COMPLETE CPM BAR CHART**

- A. The complete CPM bar chart shall be submitted within thirty (30) calendar days after receipt of notice-to-proceed. The chart shall incorporate critical path method (CPM) scheduling with the following minimum features:
  1. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
  2. Tabulate each activity using calendar dates, and identify for each activity:
    - a. Preceding and following event numbers.
    - b. Activity description.
    - c. Estimated duration of activity.
    - d. Earliest start date.
    - e. Earliest finish date.
    - f. Actual start date.
    - g. Actual finish date.
    - h. Latest start date.
    - i. Latest finish date.
    - j. Total and free float; float time shall accrue to AAFES and to AAFES' benefit.
    - k. Monetary value of activity, keyed to Schedule of Values.
    - l. Percentage of activity completed.
    - m. Responsibility.
- B. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and recomputation of all dates and float.

### **1.09 GENERAL CONTRACTOR**

- A. The General Contractor shall submit at intervals of thirty (30) calendar days a copy of the complete CPM bar chart schedule with the current activity progress clearly indicated. Cost of each activity completed and each partially completed shall be included.
- B. The General Contractor shall also submit a narrative report with the updated CPM bar chart, including a description of problem areas (current and anticipated), delaying factors and their impact, and an explanation of corrective actions taken or proposed.
- C. The General Contractor shall participate in joint review and evaluation of schedule with Contracting Officer's Representative at each submittal.
- D. After review, revise as necessary as result of review, and resubmit within 10 days.

#### **1.10 DISTRIBUTION OF SCHEDULE**

- A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Contracting Officer, Contracting Officer's Representatives, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

**PART 2 PRODUCTS – NOT USED**

**PART 3 EXECUTION – NOT USED**

**END OF SECTION**

## **SECTION 01585**

### **PROJECT SIGNS**

#### **PART 1 GENERAL**

##### **1.01 SECTION INCLUDES**

- A. Project identification sign. Located as directed by the Contracting Officer.

##### **1.02 QUALITY ASSURANCE**

- A. Design sign and structure to accommodate exterior placement.
- 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.

##### **1.03 SUBMITTALS**

- A. See Section 01300 - Submittals for submittal procedures.
- B. Attached sign exemplars are current proposed templates from AAFES. Obtain most recent sign template from AAFES prior to producing sign layout.
- C. Shop Drawing: Show content, layout, lettering, color, structure, sizes and grades of members.

#### **PART 2 PRODUCTS**

##### **2.01 SIGN MATERIALS**

- A. Structure and Framing: New, wood, structurally adequate.
- B. Sign Surfaces: Interior grade plywood with medium density overlay, minimum 1/4 inch thick, standard large sizes to minimize joints.
- 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 Attachment "A", location designated by AAFES
- B. Graphic Design, Colors, Style of Lettering: Designated by Contracting Officer's Representative.

#### **PART 3 EXECUTION**

##### **3.01 INSTALLATION**

- A. Install project identification sign within 10 days after date fixed by Notice to Proceed.
- B. Erect at designated location.
- C. Install sign surface plumb and level, with butt joints. Anchor securely.
- D. Paint exposed surfaces of sign, supports, and framing.

### **3.02 MAINTENANCE**

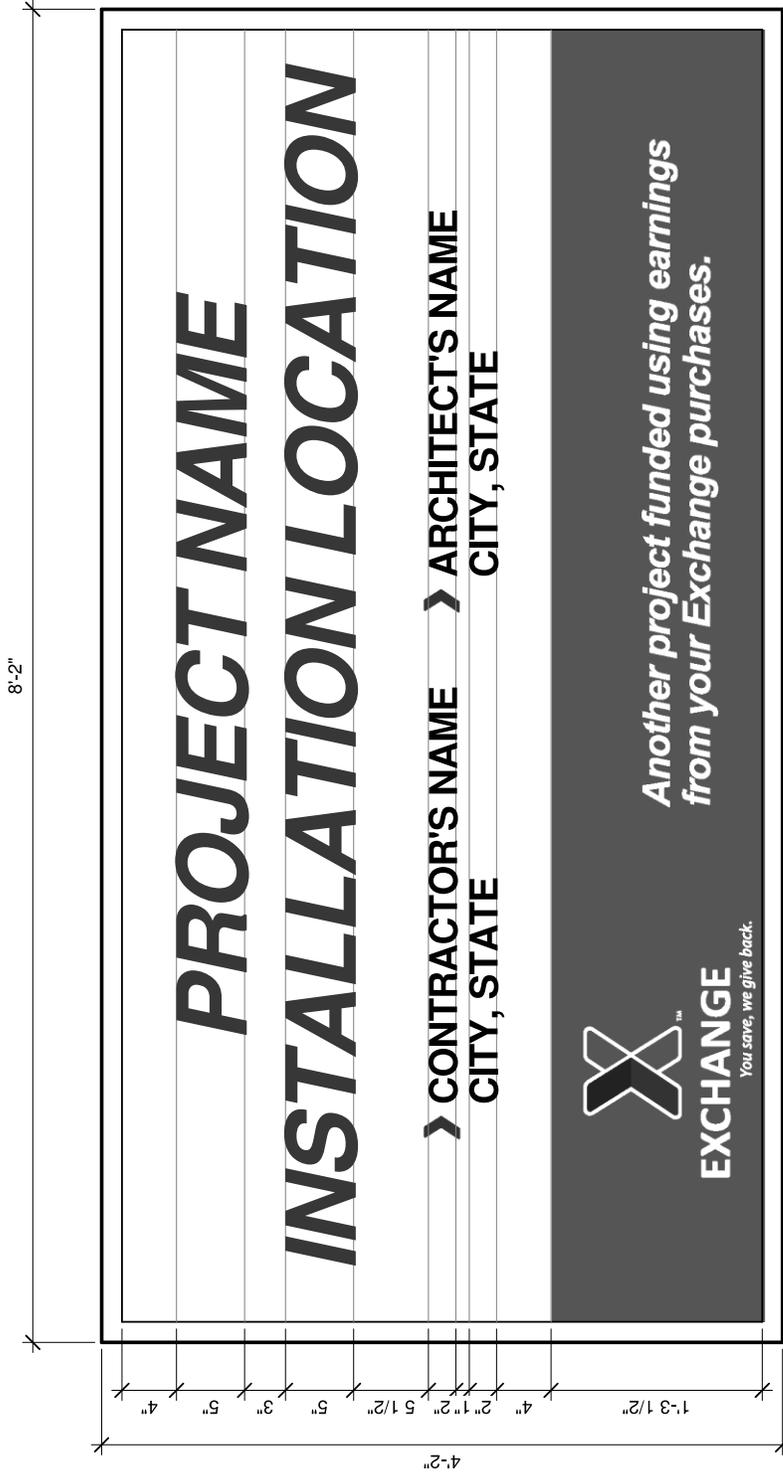
- A. Maintain signs and supports clean, repair deterioration and damage.

### **3.03 REMOVAL**

- A. Remove signs, framing, supports, and foundations at completion of Project and restore the area, to its original condition..

SEE EXAMPLE ON NEXT PAGE

**END OF SECTION**



Alternate

## SECTION 01600

### PRODUCT REQUIREMENTS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Transportation, handling, storage and protection.
- B. Product option requirements.
- C. Substitution limitations and procedures.
- D. Procedures for AAFES-supplied products.
- E. Spare parts and maintenance materials.

##### 1.02 RELATED SECTIONS

- A. Section 01400 - Quality Control: Product quality monitoring.

##### 1.03 REFERENCES

- A. 16 CFR 260 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; current edition.
- B. GreenSeal GC-03 - Anti-Corrosive Paints; Green Seal, Inc.; 1997.
- C. GreenSeal GS-11 - Architectural Paints; Green Seal, Inc.; 1993.
- D. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.; 2000.
- E. NFPA 70 - National Electrical Code; National Fire Protection Association; 2008.
- F. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113, Architectural Coatings; current edition; [www.aqmd.gov](http://www.aqmd.gov).
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).

##### 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.

## **PART 2 PRODUCTS**

### **2.01 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. Made using or containing asbestos.
- C. Where all other criteria are met, General Contractor shall give preference to products that:
  - 1. Are extracted, harvested, and/or manufactured closer to the location of the project.
  - 2. Have longer documented life span under normal use.
  - 3. Result in less construction waste.
  - 4. Are made of vegetable materials that are rapidly renewable.
- D. Urea-Formaldehyde Prohibition:
  - 1. Overall Project Requirement: Provide composite wood and agrifiber products having no added urea-formaldehyde resins.
    - a. Require each installer to certify compliance and submit product data showing product content.
  - 2. Specific Product Categories: Comply with limitations specified elsewhere.
- E. Adhesives and Joint Sealants:
  - 1. Definition: This provision applies to gunnable, trowelable, and liquid-applied adhesives, sealants, and sealant primers used anywhere on the interior of the building inside the weather barrier, including duct sealers.
  - 2. Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
    - a. Require each installer to certify compliance and submit product data showing product content.
  - 3. Specific Product Categories: Comply with limitations specified elsewhere.
- F. Aerosol Adhesives:
  - 1. Provide only products having lower volatile organic compound (VOC) content than required by GreenSeal GS-36.
    - a. Require each installer to certify compliance and submit product data showing product content.
  - 2. Specific Product Categories: Comply with limitations specified elsewhere.
- G. Paints and Coatings:
  - 1. Definition: This provision applies to paints and coatings used anywhere on the interior of the building inside the weatherproofing system and applied on-site.
  - 2. Architectural paints, coatings and primers applied to interior walls and ceilings: Do not exceed the VOC content limits established in Green Seal Standard GS-11.
  - 3. Anti-corrosive and anti-rust paints applied to interior ferrous metal substrates: Do not exceed VOC content limit of 250 g/L established in Green Seal Standard GC-03.
  - 4. Clear wood finishes, floor coatings, stains, and shellacs applied to interior elements: Do not exceed the VOC content limits established in SCAQMD Rule 1113.
    - a. Require each installer to certify compliance and submit product data showing product content.
  - 5. Specific Product Categories: Comply with limitations specified elsewhere.

- H. Flooring:
  - 1. Tile setting adhesives and grout must meet the requirements of SCAQMD Rule 1168.
    - a. Require each installer to certify compliance and submit product data showing product content.
  - 2. Specific Product Categories: Comply with limitations specified elsewhere.
- I. Provide interchangeable components of the same manufacture for components being replaced.
- J. 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.
- K. 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.

## **2.02 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.

## **2.03 SPARE PARTS AND MAINTENANCE PRODUCTS**

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to and place in location as directed; obtain receipt prior to final payment.

## **PART 3 EXECUTION**

### **3.01 SUBSTITUTION PROCEDURES**

- A. Section 01010 specifies time restrictions for submitting requests for substitutions during the bidding period.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the General Contractor.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. A request for substitution constitutes a representation that the submitter:
  - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
  - 2. Will provide the same warranty for the substitution as for the specified product.
  - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to AAFES.
  - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

- F. Substitution Submittal Procedure:
1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
  2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
  3. The Contracting Officer or designated representative will notify Contractor in writing of decision to accept or reject request.

### **3.02 AAFES-SUPPLIED PRODUCTS**

- A. See Section 01010 - Summary of the Work for identification of AAFES-supplied products.
- B. AAFES Responsibilities:
1. Arrange for and deliver AAFES 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 General Contractor.
  4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
  5. Arrange for manufacturers' warranties, inspections, and service.
- C. General Contractor's Responsibilities:
1. Review AAFES reviewed shop drawings, product data, and samples.
  2. Receive and unload products at site; inspect for completeness or damage jointly with AAFES.
  3. Handle, store, install and finish products.
  4. Repair or replace items damaged after receipt.

### **3.03 TRANSPORTATION AND HANDLING**

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. 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. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. 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**

## SECTION 01710

### CLEANING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Related Requirements Specified Elsewhere:
  - 1. Additional General Provisions.
  - 2. Summary of the Work: Section 01010.
  - 3. Cutting and Patching: Section 01045.
  - 4. Toilet Facilities: Section 01500
  - 5. Cleaning for Specific Products of Work: Specification Section for that work.
- B. Maintain premises and public properties free from accumulation of waste, debris, and rubbish caused by operations.
- C. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

##### 1.02 SAFETY REQUIREMENTS

- A. 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 use of volatile or noxious substances.
- B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  - 1. Do not burn or bury rubbish and waste material on project site.
  - 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 manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

#### PART 3 - EXECUTION

##### 3.01 DURING CONSTRUCTION

- A. Execute cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust. Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- C. Remove waste materials, debris, and rubbish from site and legally dispose of at public or private dumping areas as directed by the Contracting Officer.
- D. Vacuum clean interior building areas when ready to receive finish painting.
- E. Handle materials in a controlled manner with as few handlings as possible; do not drop or throw materials from heights.

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

### **3.02 FINAL CLEANING**

- A. Employ experienced workmen or 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 surfaces.
- C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces so designated to shine finish.
- D. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.
- E. Broom clean paved surfaces; rake clean other surfaces of grounds.
- F. Replace air conditioning filters if units were operated during construction.
- G. Clean ducts, blowers and coils, if air conditioning units were operated without filters during construction.
- H. Maintain cleaning until project, or portion thereof, is occupied by AAFES.
- I. Clean out thoroughly all new waste lines to points of connection with main sewers by rodding and power flushing.

**END OF SECTION**

## SECTION 01720

### PROJECT RECORD AND CLOSEOUT DOCUMENTS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Submittals: Section 01300.

##### 1.02 MAINTENANCE OF DOCUMENTS

- A. Maintain at job site, one copy of:
  - 1. Contract Drawings.
  - 2. Specifications.
  - 3. Amendments.
  - 4. Reviewed Shop Drawings.
  - 5. Change Orders.
  - 6. Other Modifications to Contract.
  - 7. Field Test Records.
- B. Store documents in field office apart from documents used for construction.
- C. Provide files and racks for storage of documents.
- D. File documents in accordance with Project Filing Format of Uniform Construction Index.
- E. Maintain documents in clean, dry legible condition.
- F. Do not use record documents for construction purposes.
- G. Make documents available at all times for inspection by the Contracting Officer or designated representative.

##### 1.03 MARKING DEVICES

- A. Provide red colored pencils for all markings.

##### 1.04 RECORDING

- A. Label each document "PROJECT RECORD" in 2-inch high printed letters.
- B. Keep record documents current.
- C. Do not permanently conceal any work until required information has been recorded.
- D. Contract Drawings: Legibly mark to record actual construction.
  - 1. Depths of various elements of foundation in relation to first floor level.
  - 2. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
  - 3. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
  - 4. Field changes of dimension and detail.
  - 5. Changes made by Change Order or Field Order.
  - 6. Details not on original contract drawings.
- E. Specification and Addenda: Legibly mark each Section to record:
  - 1. Changes made by Change Order or Field Order.
  - 2. Other matters not originally specified.

## 1.05 SUBMITTAL

- A. At the final inspection of the project, deliver record documents to the Contracting Officer or designated representative.
- B. Accompany submittal with transmittal letter, in duplicate, containing:
  - 1. Date.
  - 2. Project title and number.
  - 3. General contractor's (GC) name and address.
  - 4. Title and number of each record document.
  - 5. Certification that each document as submitted is complete and accurate.
  - 6. Signature of General Contractor, or his authorized representative.

## 1.06 PROJECT CLOSEOUT

- A. Maintenance Manual:
  - 1. The General Contractor shall provide operation and maintenance manuals to be used for training, operation, and maintenance of each piece of operating equipment. All material shall be clearly identified, including its location on the project. Sheets shall be 8-1/2 inches x 11 inches, except pull-out sheets may be neatly folded to 8-1/2 inches x 11 inches. Manuals shall be properly indexed, bound in plastic covered, 3-ring, loose-leaf binder with title of project lettered on front and hinge back, and shall contain:
    - a. Name, address and trade of all subcontractors.
    - b. Complete maintenance instructions; name, address and number of installing General Contractor, manufacturer's local representative, for each piece of operative equipment.
    - c. Narrative consisting of instructions for equipment and systems to include:
      - 1) Description of system and intent.
      - 2) Start-up procedures.
      - 3) Emergency procedures.
      - 4) Shut-down procedures.
      - 5) Maintenance instructions.
      - 6) Training attendance rosters.
      - 7) Warranties.
      - 8) Valve chart.
    - d. Catalogue data on plumbing fixtures, valves, water heaters, heating and cooling equipment, temperature control, fan, electrical panels, service entrance equipment and light fixtures.
    - e. Instruction for use in training and operation and maintenance of each item of operating equipment.
    - f. Manufacturer's name, type, color designation for ceramic tile, resilient floors, windows, doors, brick, concrete block, paint, roofing and other materials.
  - 2. Submit six copies of all Maintenance Manuals and all other close-out materials, prior to request for substantial completion inspection. These items shall be organized in 3-ring binders.
  - 3. Operation and Maintenance Instructions: The General Contractor shall provide at his own expense competent 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 and before requesting the final inspection. After all systems are functioning properly, the representatives shall instruct maintenance personnel of the Installation and the Exchange in the proper operation and maintenance of each item. In addition to instructions given at the project, the Installation personnel shall be given a one-day classroom instruction course on operation and maintenance of the systems. A roster of those attending with name, organization and telephone number shall be furnished.

4. Posted Operating Instructions: All major items of mechanical equipment shall have posted in a convenient and appropriate location operating instructions consisting of typewritten description of system operation, including necessary diagrams keyed to valve and piping identification systems.
  5. Preparation of DD Form 1354, "Transfer and Acceptance of Military Real Property." At the conclusion of the project, the General Contractor will compile and furnish to the Contracting Officer or designated representative all costs and quantity data of materials and systems furnished and installed. A list of items for which the costs and quantity data is required will be furnished to the General Contractor. Such information will be returned to the Contracting Officer or designated representative within 10 days from the receipt of the list. It is suggested that this information be provided and updated as the work progresses.
  6. Record Drawings: Upon completion of the work, one print of each of the drawings accompanying this specification shall be neatly and clearly marked in red pencil to show variations between the construction actually provided and that indicated or specified in the Contract Documents, and delivered to the Project Manager. Where a choice of materials and/or methods is permitted or where variations in the scope or character of the work are permitted, drawings shall define the construction actually provided. The representation of such variations shall conform to standard drafting practice and shall include supplementary notes, legends and details which may be necessary for legibility and clear portrayal of the as-built construction. The record drawings shall indicate, in addition, the actual location of all sub-surface utility lines, average depth below the surface and other appurtenances.
  7. No Asbestos Statement: Upon completion of the work, the General Contractor and all of his sub-contractors shall provide a written statement that no asbestos-containing material/product was used in the building construction.
  8. No Lead Paint Statement: Upon completion of the work, the General Contractor and his painting sub-contractor shall provide a written statement that no paint containing lead was used in the building construction.
- B. All project closeout documents not previously submitted will be given to the Contracting Officer at the Beneficial Occupancy Date inspection.
- C. Contractor shall provide all information required for filling out Form 1354 (Real Property) as instructed by the Contracting Officer. Copies of this form are available from the Contracting Officer.

**END OF SECTION**

## SECTION 01732

### WASTE MANAGEMENT

#### PART 1 GENERAL

##### 1.01 WASTE MANAGEMENT REQUIREMENTS

- A. AAFES requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, incineration, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- E. Contractor shall develop and follow a Waste Management Plan designed to implement these requirements.
- F. 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.
- G. Regulatory Requirements: General 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 01300 - Submittals: Additional submittal requirements.
- B. Section 01420 – Environmental Protection: Disposal Requirements.
- C. Section 01500 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- D. Section 01600 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.

##### 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 01300 - Submittals, for submittal procedures.
- B. Submit Waste Management Plan within 10 calendar days after receipt of Notice to Proceed, 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.

7. Recycling Incentives: Describe procedures required to obtain credits, rebates, or similar incentives.
- D. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
  2. Submit Report on a form acceptable to AAFES.
  3. Landfill Disposal: Include the following information:
    - a. Identification of material.
    - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
    - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
  4. Incinerator Disposal: Include the following information:
    - a. Identification of material.
    - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
    - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
  5. Recycled and Salvaged Materials: Include the following information for each:
    - a. Identification of material, including those retrieved by installer for use on other projects.
    - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
    - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
    - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
    - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
  6. Material Reused on Project: Include the following information for each:
    - a. Identification of material and how it was used in the project.
    - b. Amount, in tons or cubic yards.
    - c. Include weight tickets as evidence of quantity.
  7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.
- E. Recycling Incentive Programs:
1. Where revenue accrues to General Contractor, submit copies of documentation required to qualify for incentive.
  2. Where revenue accrues to AAFES, submit any additional documentation required by AAFES in addition to information provided in periodic Waste Disposal Report.

## **PART 2 PRODUCTS**

### **2.01 PRODUCT SUBSTITUTIONS**

- A. See Section 01600 - Product Requirements, for substitution submission procedures.
- B. For each proposed product substitution, submit the following information in addition to requirements specified in Section 01600:
  1. Where revenue accrues to General Contractor, submit copies of documentation required to qualify for incentive.
  2. Where revenue accrues to AAFES, submit any additional documentation required by AAFES in addition to information provided in periodic Waste Disposal Report.

1. Relative amount of waste produced, compared to specified product.
2. Cost savings on waste disposal, compared to specified product, to be deducted from the Contract Sum.
3. Proposed disposal method for waste product.
4. Markets for recycled waste product.

### **PART 3 EXECUTION**

#### **3.01 WASTE MANAGEMENT PROCEDURES**

- A. See Section 01300 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01500 for additional requirements related to trash/waste collection and removal facilities and services.
- C. See Section 01600 for waste prevention requirements related to delivery, storage, and handling.

#### **3.02 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, AAFES, and Contracting Officer or designated 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-bid meeting.
  2. Pre-construction meeting.
  3. 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**

## SECTION 01734

### INDOOR AIR QUALITY

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Construction procedures to promote adequate indoor air quality after construction.

##### 1.02 PROJECT GOALS

- A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
  - 1. Cleaning of ductwork is not contemplated under this Contract.
  - 2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
- B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
  - 1. Furnish products meeting the specifications.
  - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.
  - 3. Change air filters regularly.
- C. Ventilation: HVAC system has been designed to achieve the minimum requirements for ventilation specified in ASHRAE 62.1.

##### 1.03 RELATED SECTIONS

- A. Section 01400 - Quality Control

##### 1.04 REFERENCES

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2007.
- B. ASHRAE Std 62.1 - Ventilation For Acceptable Indoor Air Quality; 2007 (errata 2008).
- C. SMACNA (OCC) - IAQ Guideline for Occupied Buildings Under Construction; 1995.

##### 1.05 DEFINITIONS

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

## 1.06 SUBMITTALS

- A. See Section 01300 - Submittals, for submittal procedures.
- B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA IAQ Guidelines for Occupied Buildings Under Construction as a guide.
  - 1. Submit not less than 60 days before completion of work.
  - 2. Identify potential sources of odor and dust.
  - 3. Identify construction activities likely to produce odor or dust.
  - 4. Identify areas of project potentially affected, especially occupied areas.
  - 5. Evaluate potential problems by severity and describe methods of control.
  - 6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
  - 7. Describe cleaning and dust control procedures.
  - 8. Describe coordination with commissioning procedures.
- C. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
- D. Duct and Terminal Unit Inspection Report.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.
- B. Auxiliary Air Filters: MERV of 8, minimum, when tested in accordance with ASHRAE 52.2.

## PART 3 EXECUTION

### 3.01 CONSTRUCTION PROCEDURES

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
  - 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
  - 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
  - 3. Provide sufficient ventilation for drying within reasonable time frame.
- B. Begin construction ventilation when building is substantially enclosed.
- C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.
- D. HVAC equipment and ductwork **MAY NOT** be used for ventilation during construction:
  - 1. Provide temporary ventilation equivalent to 1.5 air changes per hour, minimum.
  - 2. Exhaust directly to outside.
  - 3. Seal HVAC air inlets and outlets immediately after duct installation.
- E. Do not store construction materials or waste in mechanical or electrical rooms.

- F. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
  - 1. Inspect duct intakes, return air grilles, and terminal units for dust.
  - 2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
  - 3. Clean tops of doors and frames.
  - 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
  - 5. Clean return plenums of air handling units.
  - 6. Remove intake filters last, after cleaning is complete.
  - 7. Change air filters regularly.
- G. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- H. Use other relevant recommendations of SMACNA IAQ Guideline for Occupied Buildings Under Construction for avoiding unnecessary contamination due to construction procedures.

**END OF SECTION**

## SECTION 01820

### DEMONSTRATION AND TRAINING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Training of Installation and Exchange personnel in care, cleaning, maintenance, and repair is required for:
  - 1. Weather-exposed or moisture protection products.
  - 2. Finishes, including flooring, wall finishes, ceiling finishes.
  - 3. Fixtures and fittings.
  - 4. Items specified in individual product Sections.

##### 1.02 RELATED REQUIREMENTS

- A. Section 01720 - Project Record and Closeout Documents: Operation and maintenance manuals.
- B. Other Specification Sections: Additional requirements for demonstration and training.

##### 1.03 SUBMITTALS

- A. See Section 01300 - Submittals, for submittal procedures; except:
  - 1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
  - 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 overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.
- B. Draft Training Plans: AAFES will designate personnel to be trained; tailor training to needs and skill-level of attendees.
  - 1. Submit to Contracting Officer or designated representative for transmittal to AAFES.
  - 2. Submit to Commissioning Authority for review and inclusion in overall training plan.
  - 3. Submit not less than four weeks prior to start of training.
  - 4. Revise and resubmit until acceptable.
  - 5. Provide an overall schedule showing all training sessions.
  - 6. Include at least the following for each training session:
    - a. Identification, date, time, and duration.
    - b. Description of products and/or systems to be covered.
    - c. Name of firm and person conducting training; include qualifications.
    - d. Intended audience, such as job description.
    - e. Objectives of training and suggested methods of ensuring adequate training.
    - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
    - g. Media to be used, such a slides, hand-outs, etc.
    - h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
  - 1. Include applicable portion of O&M manuals.
  - 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
  - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.

- D. Training Reports:
  1. Identification of each training session, date, time, and duration.
  2. Sign-in sheet showing names and job titles of attendees.
  3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
  4. Include Commissioning Authority's formal acceptance of training session.
- E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
  1. Format: DVD Disc.
  2. Label each disc and container with session identification and date.

#### **1.04 QUALITY ASSURANCE**

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
  1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
  2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

### **PART 2 PRODUCTS - NOT USED**

### **PART 3 EXECUTION**

#### **3.01 TRAINING - GENERAL**

- A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.
- B. Conduct training on-site unless otherwise indicated.
- C. AAFES will provide classroom and seating at no cost to General Contractor.
- D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.
- E. Provide training in minimum two hour segments.
- F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.
- G. Training schedule will be subject to availability of AAFES personnel to be trained; re-schedule training sessions as required by AAFES; once schedule has been approved by AAFES failure to conduct sessions according to schedule will be cause for AAFES to charge the General Contractor for personnel "show-up" time.
- H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
  1. The location of the O&M manuals and procedures for use and preservation; backup copies.
  2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
  3. Typical uses of the O&M manuals.
- I. Product- and System-Specific Training:
  1. Review the applicable O&M manuals.
  2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
  3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.

4. Provide hands-on training on all operational modes possible and preventive maintenance.
  5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
  6. Discuss common troubleshooting problems and solutions.
  7. Discuss any peculiarities of equipment installation or operation.
  8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
  9. Review recommended tools and spare parts inventory suggestions of manufacturers.
  10. Review spare parts and tools required to be furnished by the General Contractor.
  11. Review spare parts suppliers and sources and procurement procedures.
- J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

**END OF SECTION**

## SECTION 02060

### DEMOLITION AND REMOVALS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

- A. Work described in this section includes miscellaneous demolition and removals inside the area of the Shoppette as noted on drawings. Demolition will include, but is not limited to, removal of portions of the floor slab for installation of utilities in the existing building.

##### 1.02 JOB CONDITIONS

- A. Explosives: Use of explosives will not be permitted.
- B. Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
  - 1. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- C. Protections: Provide temporary barricades and other forms of protection as required to protect Government personnel and general public from injury due to demolition and removal work. Provide minimum of 5 ft. high temporary metal fencing (chain link with colored vision slats) to separate project work areas and as required to prevent public access into all areas in which construction work is on-going. Color of temporary fencing vision slats shall be in accordance with Installation color standards.
- D. Damages: Promptly repair all damages caused to adjacent facilities by demolition operations at no cost to Government.
- E. Utility Services: Maintain all existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.
  - 1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.
- F. Disposals: Burning any material on the installation is not approved as a method of disposal.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS - NONE SPECIFIED

#### PART 3 - EXECUTION

##### 3.01 PREPARATION

- A. Locate, identify, stub-off and disconnect utility services that are not indicated to remain.

1. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of existing building. Provide minimum of 72 hours advance notice to Government if shut-down of service is necessary during change-over.

### 3.02 DEMOLITION

- A. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Notify Contracting Officer for instructions.
- B. If and/or when hazardous materials are encountered during the course of required demolition in the existing structure contact the AAFES Contracting Officer for instructions on how to proceed. Hazardous materials may include but are not necessarily limited to: asbestos, lead-based paint, and PCB's. All removals and disposal of hazardous materials shall be conducted in strict compliance with all regulations governing same.

### 3.03 DISPOSAL OF DEMOLISHED MATERIALS

- A. Disposal:
  1. All materials will be disposed of as directed by the Contracting Officer.

### 3.04 CLEAN-UP AND REPAIR

- A. Upon completion of demolition work, remove tools, equipment and demolished materials from site.

### 3.05 ABANDONED PIPING

Abandoned piping shall be emptied and made inert prior to removal to eliminate potential spills of residual material or explosion. Residues will be disposed of as hazardous materials where applicable.

END OF SECTION

## SECTION 03100

### CONCRETE FORMWORK

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

A. Work described in this section includes furnishing labor, materials, services, equipment and related items necessary and/or required to complete structural cast-in-place concrete formwork.

B. Related work specified elsewhere includes:

03200: Concrete Reinforcement

03300: Structural Cast-In-Place Concrete

##### 1.02 REFERENCE STANDARDS

A. All work hereunder shall comply with applicable portions of the latest editions of the following, except as called for otherwise herein:

1. ACI 301 "Specifications for Structural Concrete for Buildings".
2. ACI 318 "Building Code Requirements for Reinforced Concrete".
3. ACI 347 "Recommended Practice for Concrete Formwork".

##### 1.03 DEFECTIVE WORK

A. Should misalignment of forms or screeds or excessive deflection of forms or displacement of reinforcement occur during concrete placing, corrective measures shall be immediately made to the extent that placing operations shall be stopped and concrete removed from within forms. The corrective measures shall be such as to insure acceptable lines and surfaces to the prescribed dimensions and cross sections. During and immediately after placing of concrete in forms, posts and shores shall be tightened and readjusted to maintain grades, levels and camber.

#### PART 2 - PRODUCTS

##### 2.01 DESIGN

A. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the Contractor. Except as specifically called for otherwise herein, all formwork shall meet ACI 347 as a minimum requirement.

B. Where concrete is cast against earth cut or an existing structure, such cut or structure shall be considered a form for which the Contractor shall be responsible.

C. The Contractor is responsible for informing his Subcontractors of all blockouts and dowel locations.

##### 2.02 MATERIALS

A. Forms For Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with 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. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class 1, Exterior Grade or better, mill-oiled and edge sealed, with each piece bearing legible inspection trademark, 5/8" or 3/4" thick.
- B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Form ties shall be factory-fabricated, adjustable-length, removable or snap off metal and shall have a minimum working strength when fully assembled of at least 3,000 pounds. Ties shall be designed to prevent form deflection, and to prevent spilling concrete surfaces upon removal.
1. Provide ties so portion remaining within concrete after removal is at least 1-1/2" inside concrete.
  2. Ties shall be fitted with lugs, cones, washers or other devices to act as spreaders within form which will not leave hole or depression larger than 7/8" diameter back from exposed concrete surface.
  3. Ties to be pulled from wall shall be coated with cup grease or other approved material to facilitate removal.

### PART 3 - EXECUTION

#### 3.01 FORMS

- A. Contractor has exclusive responsibility for design, engineering and construction of formwork.
- B. Design, erect, support, brace and maintain formwork to support vertical and lateral live loads and dead loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- C. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- D. Construct forms complying with ACI 347, 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 work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- E. 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, to prevent swelling and for easy removal.
- F. 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 on forms at inconspicuous locations.

- G. 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.
- H. Provide metal form ties, of adjustable-length, removable or snap-off type, designed to prevent form deflection and spalling of concrete surfaces on removal. Provide ties that snap off a minimum of 1-1/2" inside concrete and do not leave holes larger than 1" in diameter in concrete surface.
- I. 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.
- J. 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 after concrete placement if required to eliminate mortar leaks and maintain proper alignment.
- K. Corrugated metal forms shall be installed according to the manufacturer's recommended practice. Where the zinc coating is damaged in areas of finished work, the welding flux, spatter and slag shall be removed, and the areas touched up with high zinc dust content galvanize repair paint.

### 3.02 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. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.
  - 1. Set screeds in mortar pads to prevent puncturing of vapor barriers or waterproof membranes.

### 3.03 PREPARATION OF FORM SURFACES

- A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.
- B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- C. Coat steel forms with a non-staining, rust-preventative form oil or other- wise protect against rusting. Rust-stained steel formwork is not acceptable.
- D. Clean reused forms of matrix residue; repair and patch to provide acceptable surface condition.

END OF SECTION

## SECTION 03200

### CONCRETE REINFORCEMENT

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

A. Work described in this section includes furnishing labor, materials, services and related items necessary for reinforcement work of structural cast-in-place concrete.

B. Related work specified elsewhere includes:

03100: Concrete Formwork

03300: Structural Cast-In-Place Concrete

##### 1.02 REFERENCE STANDARDS

A. All work hereunder shall comply with applicable portions of the latest editions of the following except as called for otherwise herein:

1. ACI 301 "Specifications for Structural Concrete for Buildings".
2. ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
3. ACI 318 "Standard Building Code Requirements for Reinforced Concrete".
4. CRSI "Manual of Standard Practice".
5. CRSI "Recommended Practice for Placing Reinforcing Bars".
6. AWS D1.4 "Structural Welding Code - Reinforcing Steel".

##### 1.03 SUBMITTALS

A. Shop Drawings: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315, showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement and openings through concrete structures.

##### 1.04 DELIVERY, STORAGE AND HANDLING

A. Store reinforcing steel and welded wire fabric off the ground, arranged for easy identification.

B. Maintain reinforcing steel and welded wire fabric free of rust, scale or coatings.

##### 1.05 OBSERVATION

A. The Contracting Officer shall be notified at least 48 hours prior to scheduled placing of concrete that the steel will be ready for observation.

B. All reinforcing shall be observed by the Contracting Officer or his representative before concrete is placed. Such observation shall not relieve the Contractor of his responsibility for correctness and compliance with contract documents.

#### PART 2 - PRODUCTS

##### 2.01 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Steel Wire: ASTM A 82, plain, cold-drawn, steel.

- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- D. Supports for Reinforcement: Provide supports for reinforcement including 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, unless otherwise acceptable.
  - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs. Supports shall not puncture vapor barriers or waterproofing membranes.
  - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

### PART 3 - EXECUTION

#### 3.01 PLACING OF REINFORCEMENT

- A. 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.
- B. All reinforcement shall be tagged prior to shipment to the job.
- C. Reinforcement shall be carefully formed to required dimensions in accordance with fabricating standards of ACI. Metal reinforcement shall not be bent or straightened in a manner that will damage material. All bars shall be bent cold. Bars with kinks or bends not shown on drawings shall not be used.
- D. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- E. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- F. Provide necessary metal accessories for supporting reinforcing steel. Space supports a maximum of 4'-0" o.c., with the first support not over 2'-0" from the end. Provide supports for exposed concrete with stainless steel or plastic-tipped legs.
- G. Place reinforcement to obtain 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.
  - 1. Unless otherwise indicated on drawings, steel reinforcement shall have a minimum protection of concrete as follows:
    - a. Footings: 3" clear at bottom and sides and 1-1/2" clear at top.
    - b. Slabs: Not exposed to ground or to weather: 3/4" clear at top, bottom and sides.  
Exposed to ground or weather: 2" clear at top and bottom and 3" at sides.
    - c. Walls: Not exposed to ground or weather: 1-1/2" clear of each face.

Exposed to ground or weather, but placed in forms: 2" clear of each face.  
Exposed to ground or weather, but placed without forms: 3" clear of each face.

- d. Columns: Ties shall be 1-1/2" clear of each face.
  - e. Beams: 1-1/2" clear of stirrups.
2. Wherever it is necessary to splice principal reinforcement otherwise than shown on plans, character of splice shall be decided by Contracting Officer on basis of allowable bond stress and stress in reinforcement at splice. Splicing shall not be made at points of maximum stress nor shall adjacent bars be spliced at same point. Splices in column bars shall provide a lap of 30 diameters.
- H. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

END OF SECTION

## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Floors and slabs on grade.
- B. Concrete footings and grade beams.
- C. Joint devices associated with concrete work.
- D. Miscellaneous concrete elements, including equipment pads, light pole bases, thrust blocks, and manholes.

##### 1.02 RELATED REQUIREMENTS

- A. Section 03100 - Concrete Forms.
- E. Section 03200 - Concrete Reinforcement.
- F. Section 03354 - Interior Concrete Slab Repairs
- G. Section 03356 - Concrete Floor Finishing.
- H. Section 03357 - Polished Concrete Floor Finishing
- I. Section 03390 - Concrete Curing.
- J. Section 07900 - Joint Sealers.
- K. Section 15400 - Plumbing: Mechanical items for casting into concrete.
- L. Section 16000 - Electrical Work - General: Electrical items for casting into concrete.

##### 1.03 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International.
- C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International.
- D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International.
- E. ACI 305R - Hot Weather Concreting; American Concrete Institute International.
- F. ACI 306R - Cold Weather Concreting; American Concrete Institute International.
- G. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International.
- H. ASTM C 31 - Making and Curing Concrete Test Specimens in the Field; 2003a.
- I. ASTM C 33 - Standard Specification for Concrete Aggregates.
- J. ASTM C 39/C 39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- K. ASTM C 42 - Obtaining and Testing Drilled Cores and Sawed Beams of Concrete; 2003.

- L. ASTM C 94/C 94M - Standard Specification for Ready-Mixed Concrete.
- M. ASTM C 143/C 143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
- N. ASTM C 150 - Standard Specification for Portland Cement.
- O. ASTM C 172 - Standard Practice for Sampling Freshly Mixed Concrete; 1999.
- P. ASTM C 173/C 173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- Q. ASTM C 231 - Air Content of Freshly Mixed Concrete by the Pressure Method; 2003.
- R. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete.
- S. ASTM C 494/C 494M - Standard Specification for Chemical Admixtures for Concrete.
- T. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- U. ASTM C 685/C 685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
- V. ASTM C 881/C 881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- W. ASTM C 979 - Standard Specification for Pigments for Integrally Colored Concrete.
- X. ASTM C 1059 - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
- Y. ASTM C 1107/C 1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
- Z. ASTM C 1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
- AA. ASTM D 1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- AB. ASTM E 1643 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 1998.
- AC. ASTM E 1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

#### **1.04 SUBMITTALS**

- A. See Section 01300 - Submittals, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements.
- C. Verification Samples: Submit sample chips of specified colors indicating pigment numbers and required dosage rates, for subsequent comparison to installed concrete.
- D. Concrete Mix Designs: Include the following information:
  1. Proportions of cement, fine and coarse aggregate, and water.
  2. Water/cement ratio, design strength, slump, and air content.
  3. Type of cement and aggregates.
  4. Type and dosage of all admixtures.
  5. Special requirements for pumping.
  6. Any special characteristics of the mix which require precautions in the mixing, placing, or finishing techniques to achieve the finished product specified.

- E. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.
- F. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

### **1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

## **PART 2 PRODUCTS**

### **2.01 FORMWORK**

- A. Comply with requirements of Section 03100.

### **2.02 REINFORCEMENT**

- A. Comply with requirements of Section 03200.

### **2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C 150, Type I - Normal or Type II - Moderate Portland type.
  - 1. Acquire all cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C 33.
  - 1. Acquire all aggregates for entire project from same source.
- C. Fly Ash: ASTM C 618, Class C or F.
- D. Calcined Pozzolan: ASTM C 618, Class N.
- E. Silica Fume: ASTM C 1240, proportioned in accordance with ACI 211.1.
- F. Water: Clean and not detrimental to concrete.

### **2.04 CHEMICAL ADMIXTURES**

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C 260.
- C. High Range Water Reducing and Retarding Admixture: ASTM C 494/C 494M Type G.
- D. High Range Water Reducing Admixture: ASTM C 494/C 494M Type F.
- E. Water Reducing and Accelerating Admixture: ASTM C 494/C 494M Type E.
- F. Water Reducing and Retarding Admixture: ASTM C 494/C 494M Type D.
- G. Accelerating Admixture: ASTM C 494/C 494M Type C.
- H. Retarding Admixture: ASTM C 494/C 494M Type B.
- I. Water Reducing Admixture: ASTM C 494/C 494M Type A.

## **2.05 ACCESSORY MATERIALS**

- A. Underslab Vapor Barrier: Comply with ASTM E 1745, Class A. Equivalent to Stego Wrap 15-mil Vapor Barrier by Stego Industries LLC, San Juan Capistrano, CA, (877) 464-7834, [www.stegoindustries.com](http://www.stegoindustries.com). Provide seam tape, pipe boots, mastic, and other accessories as recommended by manufacturer.
- B. Non-Shrink Grout: ASTM C 1107/C 1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
  - 1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
  - 2. Minimum Compressive Strength at 28 Days: 7,000 psi.
- C. Curing Materials: Comply with requirements of Section 03390.

## **2.06 BONDING AND JOINTING PRODUCTS**

- A. Latex Bonding Agent: Non-dispersible acrylic latex, complying with ASTM C 1059 Type II.
- B. Epoxy Bonding System: Complying with ASTM C 881/C 881M and of Type required for specific application.
- C. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard or felt, complying with ASTM D 1751, 1/2 inch thick unless otherwise indicated, full depth of slab less 1/2 inch, installed with expansion joint cap.
  - 1. Expansion Joint Cap: Equivalent to W.R. Meadows "Snap-Cap;" [www.wrmeadows.com](http://www.wrmeadows.com).
    - a. Sealant Joint Size: 1/2" wide x 1/2" deep.
- D. Sealant and Primer: As specified in Section 07900.

## **2.07 CONCRETE MIX DESIGN**

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
  - 1. For trial mixtures method, employ independent testing agency acceptable to Contracting Officer's Authorized Representative for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
  - 1. Use water-reducing admixture or high-range water-reducing admixture (Superplasticizer) in concrete as required for placement and workability.
  - 2. Use nonchloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 degrees F.
  - 3. Use air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having the total air content as shown on the drawings.
  - 4. Use admixtures for water reduction and set control in strict compliance with manufacturer's directions.
- D. Normal Weight Concrete: For use in all locations, unless otherwise noted.
  - 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 4000 psi.
  - 2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
  - 3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
  - 4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
  - 5. Water-Cement Ratio: Maximum 53 percent by weight.
  - 6. Total Air Content: 4 - 6 percent, determined in accordance with ASTM C 173/C 173M.
  - 7. Maximum Slump: 4 inches.

## **2.08 MIXING**

- A. Transit Mixers: Comply with ASTM C 94/C 94M.
  - 1. Addition of water to batch for material with insufficient slump will be permitted in accordance with ACI 301, except no water shall be added on site without approval of the Testing Lab Representative on site..
  - 2. When air temperature is between 85 degrees F and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; and when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

### **3.02 PREPARATION**

- A. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
  - 1. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as otherwise indicated.
- B. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
  - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
  - 2. Use latex bonding agent only for non-load-bearing applications.
- C. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- D. Install vapor barrier under interior slabs on grade. Comply with requirements of ASTM E 1643. Lap joints minimum 6 inches and seal watertight by taping edges and ends.

### **3.03 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Contracting Officer's Authorized Representative not less than 24 hours prior to commencement of placement operations.
- D. Ensure reinforcement, inserts, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- E. Repair vapor barrier damaged during placement of concrete reinforcing. Repair with vapor barrier material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Isolation Joints in Slabs on Grade: Separate slabs on grade from vertical surfaces with joint filler.
- G. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07900 for finish joint sealer requirements.
  - 1. Install expansion joint cap over top of joint filler to help form straight, uniform and debris-free joints, resulting in 1/2" wide x 1/2" deep sealant joint channel when top of expansion joint cap is removed.
- H. Install joint devices in accordance with manufacturer's instructions.

- I. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- J. Install joint device anchors for expansion joint assemblies specified in Section 05810. Maintain correct position to allow joint cover to be flush with floor and wall finish.
- K. Apply sealants in joint devices in accordance with Section 07900.
- L. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- M. Place concrete continuously between predetermined expansion, control, and construction joints.
- N. Do not interrupt successive placement; do not permit cold joints to occur.
- O. Place floor slabs in checkerboard or saw cut pattern indicated.
  - 1. If joint pattern not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
- P. Saw cut joints as soon as troweling machines have completed finish operations. Use 3/16 inch thick blade, cut into 1/3 depth of slab thickness.
- Q. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/8 inch in 10 ft.

### **3.04 CONCRETE FINISHING**

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
  - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of Section 03356.
- E. Decorative Exposed Surfaces: "Steel trowel" as described in ACI 302.1R; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, and surfaces to be polished.
- F. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
- G. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

### **3.05 CURING AND PROTECTION**

- A. Comply with requirements of Section 03390.

### **3.06 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01400.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
  - 1. Slump: ASTM C 143; one slump test at point of discharge for each set of test cylinders taken; additional tests when concrete consistency seems to have changed.
  - 2. Air Content: ASTM C 231, volumetric method for lightweight or normal weight concrete; ASTM C 231 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 degrees F and below, when 80 degrees F and above, and each time a set of compression test specimens is made.
  - 4. Compression Test Specimens: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise indicated. Mold and store cylinders for laboratory-cured test specimens except when field-cure test specimens are required.
    - a. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
  - 5. Compressive Strength Tests: ASTM C 39; one set for each 50 cu. yds. or fraction thereof, of each concrete class placed in any one day or for each 5,000 sq. ft. of surface area placed (slabs and walls). One specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required. Any additional cylinders required by the Contractor for early strength gain tests for form stripping are the Contractor's responsibility and shall be paid for by Contractor.
    - a. When frequency of testing will provide fewer than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
- F. 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.
- G. 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 C 42, or by other methods as directed. Contractor shall pay for such tests when unacceptable concrete is verified.
- H. Comply with requirements of Section 01410 for additional testing and inspection services required.

### **3.07 DEFECTIVE CONCRETE**

- A. Test Results: The testing agency shall report test results in writing to Contracting Officer's Authorized Representative, and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Contracting Officer's Authorized Representative. The cost of additional testing, repair or replacement shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Contracting Officer's Authorized Representative for each individual area.

**END OF SECTION**

## SECTION 03354

### INTERIOR CONCRETE SLAB REPAIRS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Joint filler removal and replacement.
- B. Joint edge spall repair.
- C. Crack repair.
- D. Surface defect repair, including pop-outs, chips, spalls, and pitting.
- E. Removal and replacement of previously completed repairs not in compliance with this section.

##### 1.02 RELATED REQUIREMENTS

- A. Section 03300 Structural Cast-In-Place Concrete
- B. Section 03356 Polished Concrete Floor Finishing

##### 1.03 SUBMITTALS

- A. Section 01300 - Submittal: Procedures for Submittals.
- 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.
  - 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.

##### 1.04 QUALITY ASSURANCE

- A. AAFES reserves the right to engage the services of a Concrete Consultant to review, observe and inspect the work in progress.

##### 1.05 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 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

##### 2.01 MATERIALS

- A. Subject to compliance with project requirements, provide products as manufactured by the following to the extent as specified hereinafter:
  - 1. Metzger/McGuire (800) 223-6680.
  - 2. Roadware (800) 522-7623

- B. Polyurea Joint Filler: Rapid setting, two-component polyurea polymer liquid of 100% solids content, Shore hardness 85-90, compatible with construction materials in contact.
  - 1. Spal-Pro RS 88 in "Curry" by Metzger/McGuire.
  - 2. Match color of adjacent exposed concrete slab surface.
- C. Joint Filler Stain Preventing Film:
  - 1. SPF by Metzger/McGuire.
- D. Low Viscosity Rigid Urethane:
  - 1. Rapid ReFloor in "Curry" by Metzger/McGuire.
  - 2. 10 Minute Mender or Matchcrete by Roadware
  - 3. Match color of adjacent exposed concrete slab surface.
- E. Silica Sand
  - 1. Dry 00 Sandblasting sand.

## **2.02 EQUIPMENT**

- A. Subject to compliance with project requirements, provide equipment manufactured by the following:
  - 1. HTC (877) 482-8700, [www.htc-america.com](http://www.htc-america.com) <<http://www.htc-america.com>>
  - 2. Joe Due Blades and Equipment, Mauston, WI, (877) 563-383.
  - 3. Pullman-Ermator (800) 232-2635, [www.pullman-ermator.com](http://www.pullman-ermator.com) <<http://www.pullman-ermator.com>>
    - a. SASE Company, Inc, Kent, WA (800) 522-2606
    - b. U.S. Saws, Santa Ana, CA (866) 987-7297.
- B. 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.
    - c. Bull 50, by SASE Company, Inc.
    - d. Approved equal.
- C. Joint Filler Removal and Preparation
  - 1. Humpback Cutter Complete, by Joe Due.
  - 2. Dust Buggy, by U.S. Saws.
  - 3. Approved equal.
- D. Crack Repair:
  - 1. 5" Dustmizer 007, by Joe Due.
  - 2. 5" Crack Attacker, by Joe Due.
  - 3. 7" Handheld Crack Chaser, by Joe Due.
  - 4. SawTec 5" Tile Vac, by U.S. Saws.
  - 5. SawTec 7" Crac-Vac, by U.S.Saws.
  - 6. Approved equal.
- E. Surface Grinder: Handheld 5"-7" electric surface grinder with dustless shroud/housing.
  - 1. Dust Avenger 5, by Joe Due.
  - 2. Dust Avenger 7, by Joe Due.
  - 3. SawTec 5" Grinder Vac, by U.S. Saws.
  - 4. SawTec 7" Grinder Vac, by U.S. Saws.
  - 5. Approved equal.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. An evaluation of the existing floor slab shall be conducted, identifying all defects. Scope of repairs shall be confirmed by the AAFES Contracting Officer, Architect of Record, or AAFES 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 acceptable unless specifically approved on a case-by-case basis by the AAFES Contracting Officer, Architect of Record or Concrete Consultant.

### **3.02 PREPARATION**

- A. Protect surface of slab immediately adjacent to defect under repair.

### **3.03 JOINT MILLING AND CAP FILLER REPLACEMENT (See Figure 1 at end of Section)**

- 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:
- B. 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.
- C. 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.
- D. Ensure that after grinding, the joint is cut smooth and flush with the finish floor surface, without concave or intermittent, darkened profile.

### **3.04 FULL DEPTH JOINT FILLER REPLACEMENT (See Figure 2 at end of Section)**

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

### **3.05 SPALLED JOINT REPAIR (LESS THAN 1") (See Figures 3 and 4 at end of Section)**

- A. For joints that are spalled or have radius tooled edges not exceeding 1" in width at slab surface.
- B. 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.
- C. Clean joint of loose concrete, joint filler, laitance, dirt, debris, backer rod, etc.
- D. Joints must be free of all visible moisture.

- E. 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.
- F. Gravity feed a trace amount (1/8") of silica sand into joint to prevent 3-sided bonding of joint filler.
- G. Fill joint cavity per manufacturer's instructions, taking care not to entrap large air bubbles. Overfill joint slightly and shave flush to slab surface prior to grinding process.

### **3.06 SPALLED JOINT REPAIR (GREATER THAN 1") (See Figure 5 at end of Section)**

- A. For joints that are spalled and exceeding 1" in width at slab surface.
- B. 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 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.
- C. Overfill repair cavity with 10 Minute Mender or Matchcrete per manufacturer's instructions and grind flush to slab surface.
- D. After urethane repair has cured, and prior to any traffic on patched surface, re-saw original slab joint(s) and fill with polyurea joint filler per manufacturer's instructions.

### **3.07 CRACK REPAIR (See Figure 6 at end of Section)**

- A. Crack width less than 1/32" without surface spalling.
  - 1. Do not repair.
- B. Cracks from 1/32" to 1/4" in width.
  - 1. Clean crack cavity.
    - a. 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.
    - b. Remove any loose segments, including islands formed by crack, with sharp tool.
    - c. Use methods that will not widen existing crack.
    - d. Vacuum crack to remove all dirt, debris and other laitance.
    - e. Mask slab surface along crack as necessary to minimize overfill.
    - f. Choose material color that closely matches the adjacent floor.
    - g. Install low viscosity rigid urethane repair material in accordance with manufacturer's instructions.
    - h. Repeat until all voids are filled and material crowns slab surface.
      - 1) Do not flood area around crack.
      - 2) Watch for bubble formation and out gassing.
      - 3) Do not allow material to gel before adding additional material.
    - i. Shave or grind material flush to surface as stipulated by manufacturer.
- C. Cracks from 1/4" to 1" in width
  - 1. Saw top or edge of crack to provide square edge, minimum 3/4" in depth.
    - a. Use small hand grinder with maximum 5" diameter blade, minimizing eventual crack width while maintaining uniformity of shape.
    - b. Clean crack cavity.
      - 1) Vacuum crack to remove all dirt, debris and other laitance.
      - 2) Remove all visible moisture.
    - c. Mask slab surface along crack as necessary to minimize overfill.

- d. Install polyurea joint filler.
  - 1) Dispense sample into small bucket to test blending of material.
  - 2) Prime crack with repair material.
  - 3) Dispense material, dragging dispenser tip along crack, until it flows over the slab.
- e. Wait approximately 10 minutes, periodically checking for material cure.
  - 1) Check condition of material by shaving with razor scraper.
  - 2) Material will shave smooth when cured.
  - 3) Proper timing is crucial.
    - (a) Too long and material will be difficult to shave
    - (b) Too soon and material will ravel.
- f. Shave material flush to slab surface per manufacturer's instructions.

### **3.08 SURFACE SPALLING REPAIR (See Figure 7 at end of Section)**

- A. Route edge of spall to provide 1/2" deep square edge.
  - 1. Use small hand grinder with maximum 5" diameter dry diamond blade and vacuum system attachment.
  - 2. Do not overcut slots into existing slab surface.
- B. Clean and prep spalled cavity.
  - 1. Wire brush spalled surface to remove all dirt and laitance.
  - 2. Mask slab at perimeter of spall with tape.
- C. Install low viscosity rigid urethane repair material using tube cartridge without flow restrictor.
- D. Polish over repair area with diamond disks to blend surface.
  - 1. Feather filler material into the adjacent concrete floor surface.
  - 2. With 2000 grit disk and firm pressure, add a few burn marks to mottle surface to blend with adjacent floor surface.
- E. NOTE: For spalled joints, a form material may be needed to temporarily support vertical face of spalled joint edge. Ensure that the repair material will not adhere to the form.

### **3.09 HIGH RACK BOLT HOLE/SPALL REPAIR**

- A. Recess steel bolt a minimum of 1/2" below finish floor by either punching or cutting.
- B. For spall fracture edge less than 30 degrees, square edge to a minimum 3/8" depth with either a drill bit or chisel.
- C. Clean cavity of all debris and laitance with drill activated, brass wire wheel. Vacuum hole to remove all dirt, debris and other laitance.
- D. Dispense low viscosity rigid urethane at moderate pace using steady pressure. Dispense material into void, refilling as necessary to produce slight crown.
- E. Grind material flush to slab surface per manufacturer's instructions.

### **3.10 LARGE SURFACE REPAIR**

- A. Edge perimeter with diamond masonry wheel to produce sharp edge, at least 3/8" deep.
- B. Roughen base surface and vacuum clean. Wire brush to remove any small loose material and vacuum again.
- C. Protect adjacent slab surface with tape at perimeter of repair area, width as required to prevent scratching during troweling operations.
- D. Pre-wet void with urethane repair material.
- E. Prepare slurry of urethane repair material mixed with equal parts of 70 or 80-mesh dry silica sand.

- F. Mix repair material in accordance with manufacturer's instructions.
- G. Place repair material in floor surface defect and float level.
- H. Keep surface clean during troweling operations to prevent any laitance from coming in contact with the repair material and marring surface.
- I. Check material set after 30 minutes to 1 hour. Surface should not dent with fingernail under hard hand pressure.
- J. Remove tape and clean area of all particles on repair surface and adjacent floor surface.
- K. 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 SURFACE PITTING REPAIR (See Figure 8 at end of Section)**

- A. 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.
- B. Vacuum prepared pitted sections.
- C. Dispense low viscosity rigid urethane repair material generously in and around pitted areas.
- D. Immediately trowel repair material flush with slab surface and repeat troweling in opposite directions until material begins to thicken (approximately 2 minutes). If material sticks to trowel, wipe with denatured alcohol.
  - 1. Ensure a thin, uniform layer of repair material covers the pitted areas. Refill any low spots as needed.
- E. Allow repair material to fully cure (approximately 90-120 minutes for thin film).
- F. Grind overfill with 80-grit metal-bond pads, ensuring repair material is flush with slab surface.
- G. Repeat repairs in areas as required if repair material pulls out of defects. Allowing a longer curing time typically minimizes material pull out.

**3.12 PROTECTION**

- A. Protect surfaces of finished floor.
- B. Prohibit traffic until floor repairs have received final approval by Owner.

Figure 1

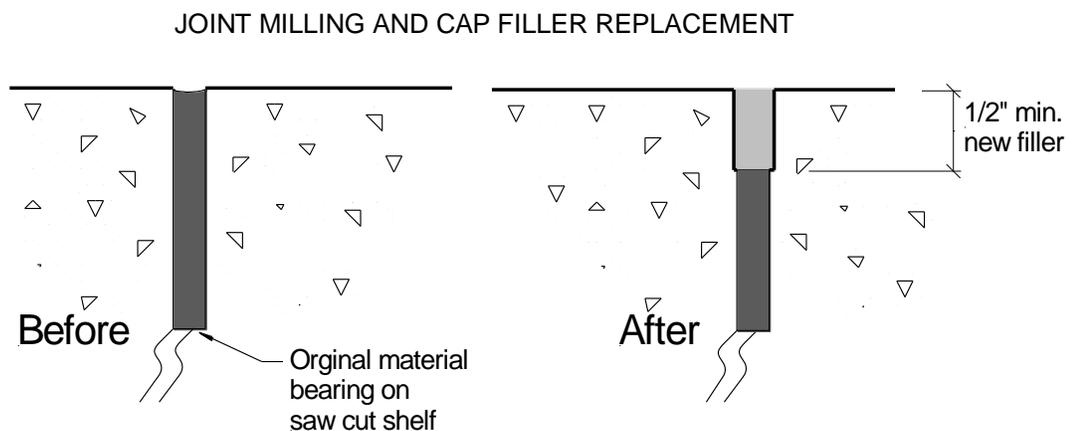
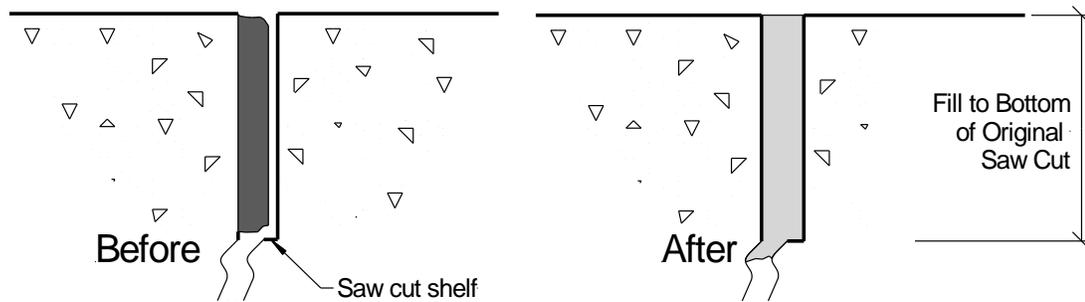


Figure 2

FULL DEPTH JOINT FILLER REPLACEMENT



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 compressibel backer rod or bagged silica sand.

Figure 3

SPALLED JOINT REPAIR (LESS THAN 1")

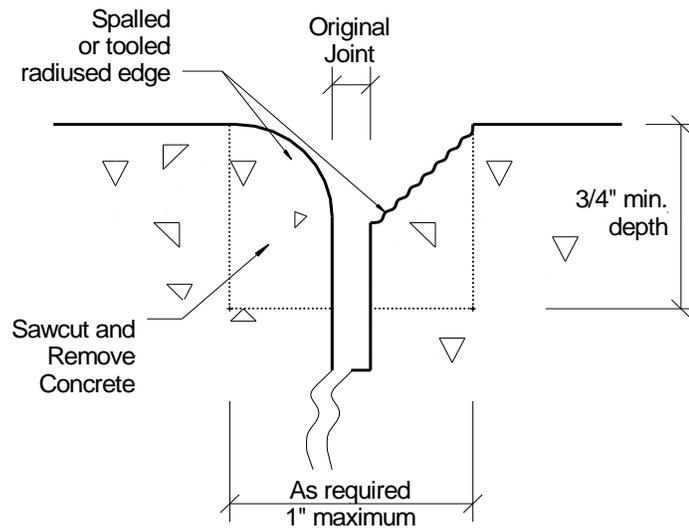


Figure 4  
SPALLED JOINT REPAIR (LESS THAN 1")

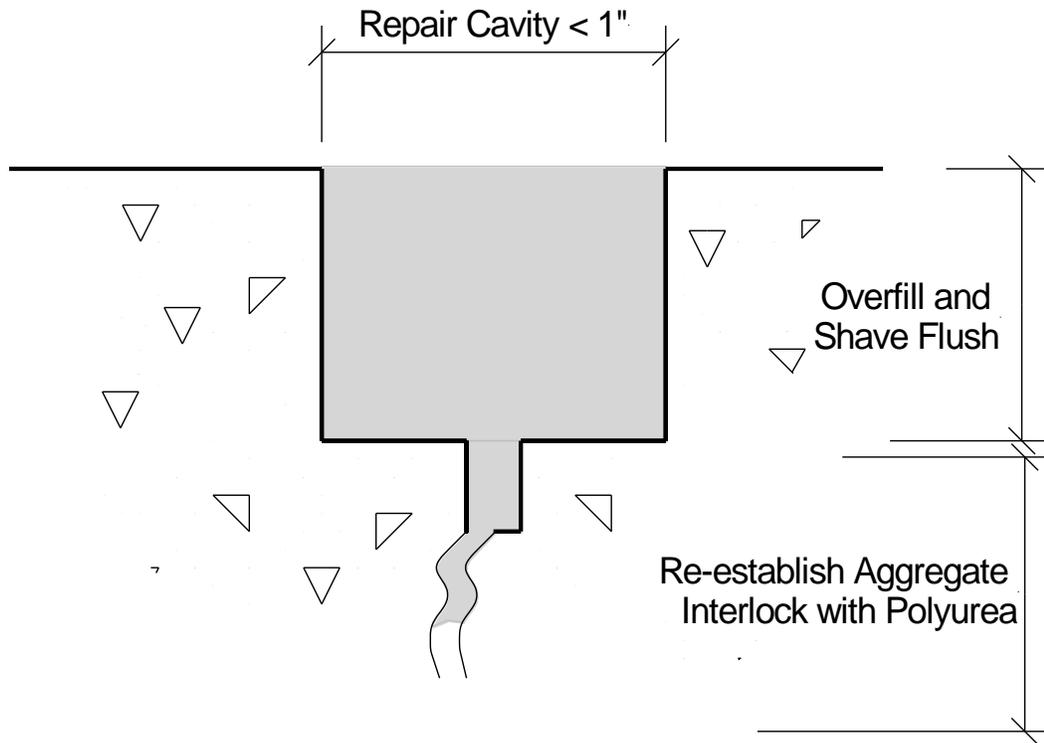


Figure 5

SPALLED JOINT REPAIR (GREATER THAN 1")

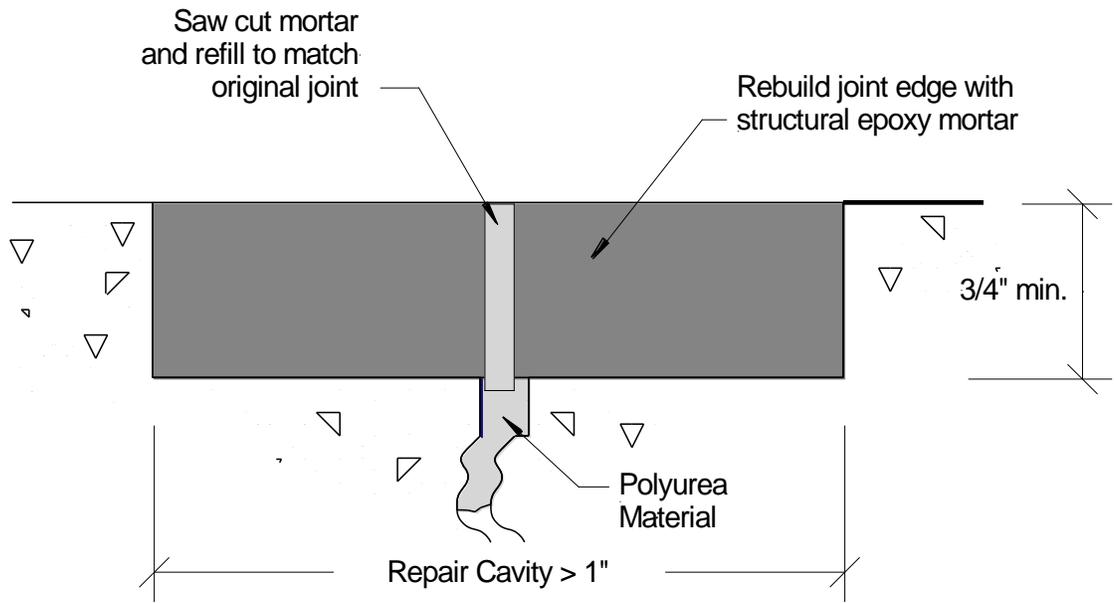


Figure 6

CRACK REPAIR

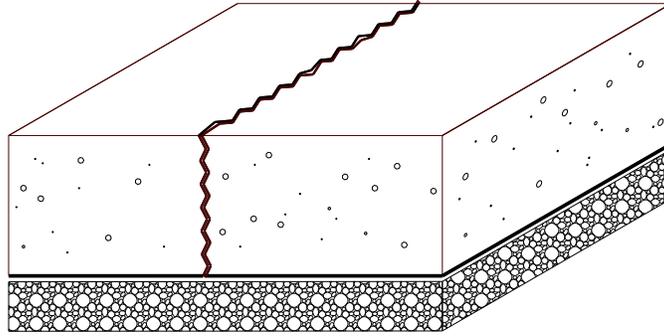


Figure 7

SURFACE SPALLING REPAIR

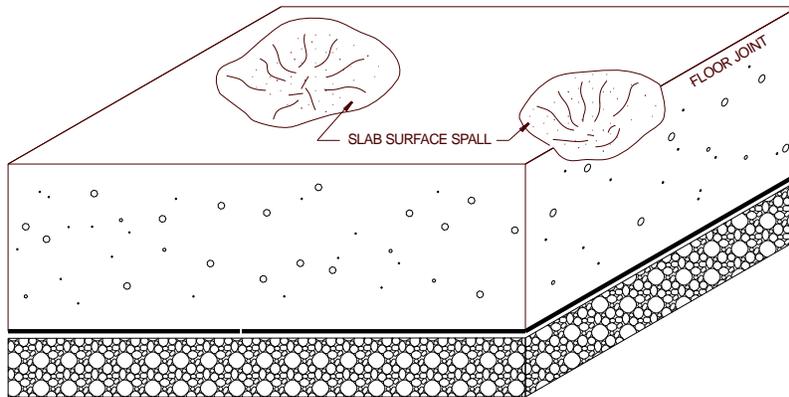
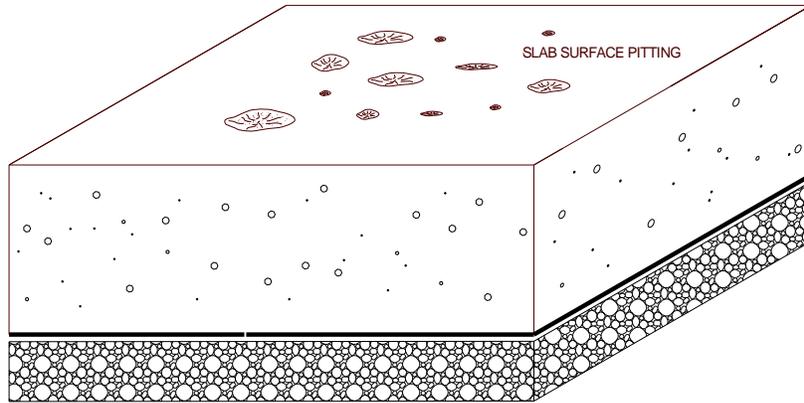


Figure 8

SURFACE SPALLING REPAIR



**END OF SECTION**

## SECTION 03356

### POLISHED CONCRETE FLOOR FINISH

#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Installation of polished concrete floor system for new and/or 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 treatment.

##### 1.2 RELATED SECTIONS

- A. Section 01300 – Submittal Procedures.
- B. Section 03354 – Interior Concrete Slab Repairs and Joint Filler Replacement.
- C. Division 09 – Finishes

##### 1.3 REFERENCES

- A. ASTM C 1028 – Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
- B. ASTM D 523 – Standard Test Method for Specular Gloss.
- D. NFSA - National Floor Safety Institute; Test Method 101A; current edition.

##### 1.4 SUBMITTALS

- A. Comply with Section 01300 – 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. Specified dye
    - b. Liquid reactive surface densifier
    - c. Liquid stain guard treatment
    - d. Joint filler
    - e. Crack and spall repair product

- f. Self leveling, dye-able, overlay product
- g. Grout coat, pin hole and small defect surface treatment

C. Installer's Certification:

1. Provide list of 5 projects performed with 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 AAFES.
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

## 1.5 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.

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.

2. Require attendance of parties directly affecting work of this section, including:
  - a. AAFES Project Manager
  - b. AAFES Store Manager or Assistant Manager
  - c. Project Architect
  - d. Owner's Polishing Consultant
  - e. General Contractor
  - f. Polishing Subcontractor including Project Manager and Foreman
3. 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.

## 1.6 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.

Mock-up will include properly repaired surface spalls, slab joints and slab edge treatments including complementary edge banding.

- B. Locate mock-up where directed by AAFES 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.

1.7 PROJECT CONDITIONS

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

PART 2 PRODUCTS

2.1 PRE-CERTIFIED INSTALLERS

A. All bidding contractors must have completed our in house certification for this project. Below is a list of pre-approved applicators.

<u>Company Name</u>	<u>Number</u>	<u>Region Covered</u>
1. American Concrete Inc.	877-775-0030	U.S.A
2. Avalon Corporation	425-643-5667	Northwest
3. Bomanite of North Texas	800-492-2524	Southwest
4. Budget Maintenance Concrete	610-323-7702	Northeast
5. Diama-Shield	888-730-4075	North
6. Final Touch	614-751-0606	Midwest
7. Jeffco Concrete Contractors	800-226-2668	Southeast
8. K & J Concrete Polishing	865-971-1760	Southeast
9. Kote It Inc	260-637-7051	Midwest
10. Pacific Decorative Concrete	916-725-9269	West
11. Perfect Polish Inc.	877-917-4463	U.S.A
12. Questmark	888-922-4346	U.S.A
13. Stone Care of Texas	210-656-8019	South
14. Total Polish Solutions	865-633-5051	U.S.A.
15. Wholesale Floors	602-248-7878	Southwest

B. Refer to specifications Division 1 for substitution qualifications. Any substitutions must be submitted in writing a minimum of 10 days prior to bid date to the AAFES project manager for approval.

2.3 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.
  - 4. Grinding Pressure: 600 pounds minimum.
- B. Dust Extraction System and pre-separator for grinding/polishing:  
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:
  - 1. HTC 86D
  - 2. Pullman-Ermator T8600

3. SASE Bull 1250
  4. 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.
- D. Diamond Tooling for Polishing Concrete:
1. Resin Bonded, Phenolic Diamonds
    - a. Grit Size: Transitional diamond equal to Raptor L3 by VMC, 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.
- E. Hand Grinder with dust extraction attachment and pads.
- F. Joint cutting saw with dust extraction attachment
1. Hump Back, by Joe Due
  2. Dust Buggy, by US Saws
  3. The Mongoose, by Engrave-a-Crete
- 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 1,500 RPM or higher.
- J. Diamond Impregnated Burnisher Pads
1. Twister Diamond Cleaning System Pads, by HTC
  2. Diamond Polishing Pads, by Norton
  3. SpinFlex Diamond Polishing Pads, by CPS
- K. Applicator Pads and Equipment
1. Professional Mighty Mop 077, by Quickie
  2. 24" Microfiber Wet Room Mop, by Rubbermaid
  3. Fas-Trak Chemical Application System, by Fas-Trak Industries
  4. Humm'V II, by Tuffy Systems, Inc.

## 2.3 MATERIALS

- A. Penetrating Hardener/Densifier: Clear liquid reactive lithium-silicate based.
1. RetroPlate 99 by Advanced Floor Products.
  2. FGS Permashine by L&M Construction Chemicals.
  3. Consolideck LS, by Prosoco.
  4. SureLock Densifier by Ameripolish
  5. No Substitutions
- B. Protective Surface Treatment (Stain Guard):
1. SureLock Stain Protector by Ameripolish.
  2. Consolideck LS Guard, by Prosoco.
  3. No Substitutions

C. Solvent-base dye color

Standards are to be as follows.

**Shoppette's**

- 1.) Renovation- Polished Dyed Concrete, AmeriPolish- Carmel
- 2.) No Borders

D. Joint Filler

1. RS 88 Polyurea in complementary darker color to match Dyed Polished Concrete, by Metzger McGuire
2. HT-PE85 Polyurea in complementary darker color to match Dyed Polished Concrete, by Hi-Tech Systems
3. SL/85 Polyurea in complementary darker color to match Dyed Polished Concrete, by VersaFlex Incorporated
4. Colors to be matched as closely as possible using a Sherwin Williams color chart. Manufacturer to produce product to match this color selection.

F. Crack and Spall Repair

1. Rapid Refloor in complementary matching color, by Metzger McGuire
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 AAFES Project Manager in mock-up.

G. Wide Area Surface Repairs

1. TRU Self Leveling, by CTS Cement Manufacturing Corporation

H. Grout Coat

- a. GM 3000 by Husqvarna Construction Products
- b. Diama-Fill, by Ardex Engineered Cements

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- A. Examine floor to receive polished concrete floor system.
- B. Notify the Contracting Officer 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.

**3.2 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 overspray of water or solvent based dye treatment.
  5. 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 ½ of an inch of existing joint material and replace with approved 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 could adversely affect installation of polished concrete floor system.
- A. Refill new concrete joints (including decorative joints) in accordance with Section 07900.
- G. Repair all slab defects and joints in accordance with Section 03 35 40

### 3.3 INSTALLATION

- A. Install polished concrete floor system in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. 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 AAFES Project Manager. Obtain approval from AAFES 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, dying and stain guard application are anticipated, but must be discussed and approved in writing by the AAFES Project Manager prior to executing the work.
    - c. For new concrete floors, open-up concrete by grinding with 80-grit metal-bonded.
    - e. Progressive edge grinding will be necessary with ½" of all vertical abutments, including walls, cases, columns, posts and racking systems.
    - f. Joint filler and spall repairs shall be flush with surface after grinding and polishing steps. Additional passes along curled joints may be necessary to 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 per manufacturer's recommendations and the concrete's acceptance of the product.
  - 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 at a slow movement pace using high speed machine with 400 or 800 grit diamond impregnated pads as required to achieve specified gloss requirements. (For approved pads see section 2.3 J )
  - 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 installer's instructions.
- 2. Apply penetrating dye after 200 or 400-grit resin-bonded diamond-grinding step in accordance with manufacturer's recommendations and approved mock-up.
- 3. Thoroughly auto-scrub surface clean of excess dye residue in accordance with manufacturer's instructions.
- 4. Repeat application of penetrating dye if due to porosity of floor or darker color is desired. Bids shall be based on providing 2 applications of Dye.

3.4 FIELD QUALITY CONTROL

- A. Inspect completed polished concrete floor system with the Contracting Officer, Contractor, and Installer.
- B. Review procedures with Contracting Officer to correct unacceptable areas of completed polished concrete floor system.
- C. Specular Gloss/Reflectance, ASTM D 523:
  - 1. Perform polishing and burnishing work necessary to produce a Specified Overall Gloss Value (SOGV)  $\geq 50$  prior to applying protective surface treatment, SOGV  $\geq 60$  after applying protective surface treatment, Minimum Local Gloss Value (MLGV)  $\geq 40$  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. Collects 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.

3.5 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.
  - 3. Prohibit parking of vehicles on concrete slab.
  - 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 05500

### METAL FABRICATIONS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Shop fabricated steel items.

##### 1.02 RELATED REQUIREMENTS

- A. Section 03300 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 09900 - Paints and Coatings: Paint finish.

##### 1.03 REFERENCE STANDARDS

- A. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
- B. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- D. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
- E. ASTM A 500/A 500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- F. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings.
- G. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings.

##### 1.04 SUBMITTALS

- A. See Section 01300 - Submittals, for submittal procedures.
- 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.

##### 2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A 283.
- D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- G. 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. 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.

- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. 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, concrete filled, crowned cap, as detailed; galvanized finish.

### **2.04 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. Do not prime surfaces in direct contact with concrete.
  - 4. Do not prime surfaces where field welding is required.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: Two coats.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A 123/A 123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements.

### **2.05 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 or embedded in masonry.

### **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.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

### **END OF SECTION**

## SECTION 06100

### ROUGH CARPENTRY

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Preservative treated wood materials.
- B. Fire retardant treated wood materials.
- C. Communications and electrical room mounting boards.
- D. Concealed wood blocking, nailers, and supports.
- E. Miscellaneous wood nailers, furring, and grounds.

##### 1.02 RELATED SECTIONS

- A. Section 06200 - Finish Carpentry.

##### 1.03 REFERENCES

- A. AFPA T10 - Wood Frame Construction Manual; American Forest and Paper Association; 2001.
- B. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.
- C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2007.
- D. AWPA C2 - Lumber, Timber, Bridge Ties and Mine Ties -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- E. AWPA C9 - Plywood -- Preservative Treatment by Pressure Processes; American Wood-Preservers' Association; 2003.
- F. AWPA C20 - Structural Lumber -- Fire Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- G. AWPA C27 - Plywood -- Fire-Retardant Treatment by Pressure Processes; American Wood-Preservers' Association; 2002.
- H. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood-Preservers' Association; 2007.
- I. PS 1 - Structural Plywood; 2007.
- J. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.
- K. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.

##### 1.04 SUBMITTALS

- A. See Section 01300 - Submittals, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials and application instructions.
- 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.

## **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. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
  - 3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee ([www.alsc.org](http://www.alsc.org)) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
  - 4. 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**

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- 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. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E 84.
- B. Miscellaneous Panels:
  - 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.

### **2.04 ACCESSORIES**

- A. Fasteners and Anchors:
  - 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, corrosion-resistant coated steel elsewhere.
  - 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. Water-Resistive Barrier: No. 30 asphalt felt.

### **2.05 FACTORY WOOD TREATMENT**

- A. Treated Lumber and Plywood: Comply with requirements of AWP A 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. Preservative Treatment:
  - 1. Manufacturers:
    - a. Arch Wood Protection, Inc: [www.wolmanizedwood.com](http://www.wolmanizedwood.com).
    - b. Chemical Specialties, Inc; Product : [www.treatedwood.com](http://www.treatedwood.com).
    - c. Osmose, Inc; Product : [www.osmose.com](http://www.osmose.com).
    - d. Substitutions: See Section 01600 - Product Requirements.
- C. Preservative Pressure Treatment of Lumber Above Grade: AWPA Use Category UC3B, Commodity Specification A (Treatment C2) using waterborne preservative to 0.25 lb/cu ft retention.
  - 1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
  - 2. Treat lumber in contact with roofing, flashing, or waterproofing.
  - 3. Treat lumber in contact with masonry or concrete.
  - 4. Treat lumber less than 18 inches above grade.
    - a. Treat lumber in other locations as indicated.
  - 5. Preservative Pressure Treatment of Plywood Above Grade: AWPA Use Category UC2 and UC3B, Commodity Specification F (Treatment C9) using waterborne preservative to 0.25 lb/cu ft retention.
    - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
    - b. Treat plywood in contact with roofing, flashing, or waterproofing.
    - c. Treat plywood in contact with masonry or concrete.
    - d. Treat plywood less than 18 inches above grade.
    - e. Treat plywood in other locations as indicated.
- D. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA Use Category UC4A, Commodity Specification A (Treatment C2) using waterborne preservative to 0.4 lb/cu ft retention.
  - 1. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.
  - 2. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

## **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 FRAMING INSTALLATION**

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.
- E. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

### **3.04 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 framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
- C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- D. 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.
- E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- F. Specifically, provide the following non-structural framing and blocking:
  1. Cabinets and shelf supports.
  2. Wall brackets.
  3. Wall-mounted door stops.
  4. Chalkboards and marker boards.
  5. Wall paneling and trim.
  6. Joints of rigid wall coverings that occur between studs.

### **3.05 INSTALLATION OF CONSTRUCTION PANELS**

- A. Subflooring/Underlayment Combination: Screw to framing; staples are not permitted.
- B. Communications and Electrical 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. Waste Disposal: Comply with the requirements of Section 01732.
  - 1. Comply with applicable regulations.
  - 2. Do not burn scrap on project site.
  - 3. Do not burn scraps that have been pressure treated.
  - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

**END OF SECTION**

## SECTION 06410

### CUSTOM CABINETS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Countertops.
- C. Cabinet hardware.
- D. Preparation for installing utilities.

##### 1.02 RELATED REQUIREMENTS

- A. Section 01600 - Product Requirements

##### 1.03 REFERENCE STANDARDS

- A. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use.
- B. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada.
- C. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association (ANSI/HPVA HP-1).
- D. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association.
- E. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association.
- F. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce).

##### 1.04 SUBMITTALS

- A. See Section 01300 - Submittals, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

##### 1.05 QUALITY ASSURANCE

- A. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

##### 1.06 MOCK-UP

- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, and finishes.

- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect units from moisture damage.

### **1.08 FIELD CONDITIONS**

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

## **PART 2 PRODUCTS**

### **2.01 WOOD-BASED COMPONENTS**

- A. Provide composite wood and agrifiber products having no added urea-formaldehyde resins.

### **2.02 LUMBER MATERIALS**

- A. Softwood Lumber: NIST PS 20; Graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Grade II/Custom; average moisture content of 8-13 percent; species as recommended by manufacturer.

### **2.03 PANEL MATERIALS**

- A. Hardwood Faced Plywood: HPVA HP-1; graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, veneer (wood plies) core; exterior glue; thickness as indicated; face veneer as follows:
  - 1. Concealed Surfaces: Grade C, Birch, rotary cut, random-matched.
    - a. Use as backing for countertops.
    - b. Use as backing for plastic laminate at wet areas.
- B. Medium Density Fiberboard (MDF): ANSI A208.2; type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated; composed of wood fibers pressure bonded with moisture resistant adhesive to suit application; sanded faces; thickness as indicated.
  - 1. Use for components not indicated as another material.
  - 2. Use as backing for plastic laminate unless otherwise indicated.

### **2.04 LAMINATE MATERIALS**

- A. Manufacturers:
  - 1. Formica Corporation: [www.formica.com](http://www.formica.com).
  - 2. Panolam Industries International, Inc\Nevamar: [www.nevamar.com](http://www.nevamar.com).
  - 3. Wilsonart International, Inc: [www.wilsonart.com](http://www.wilsonart.com).
  - 4. Substitutions: See Section 01600 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications and as follows:
  - 1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, colors as indicated, finish as selected.
  - 2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, colors as indicated, finish as selected.
  - 3. Cabinet Liner: CLS, 0.020 inch nominal thickness, color as selected, finish as selected.
  - 4. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

### **2.05 COUNTERTOPS**

- A. Plastic Laminate Countertops: Plywood substrate covered with HPDL, post formed.

### **2.06 ACCESSORIES**

- A. Adhesive: Type recommended by AWI/AWMAC to suit application.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and satin chrome finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Grommets: Standard plastic or rubber grommets for cut-outs, in color as selected by Architect.

## **2.07 HARDWARE**

- A. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards and coordinated self rests, satin chrome finish, for nominal 1 inch spacing adjustments.
- B. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers.
- C. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
- D. Drawer Slides:
  - 1. Type: Full extension.
  - 2. Static Load Capacity: Heavy Duty grade.
  - 3. Mounting: Side mounted.
  - 4. Stops: Integral type.
  - 5. Features: Provide self closing/stay closed type.
  - 6. Manufacturers:
    - a. Accuride International, Inc: [www accuride.com](http://www accuride.com).
    - b. Grass America Inc: [www.grassusa.com](http://www.grassusa.com).
    - c. Knappe & Vogt Manufacturing Company: [www.knappeandvogt.com](http://www.knappeandvogt.com).
    - d. Substitutions: See Section 01600 - Product Requirements.
- E. Hinges: European style concealed self-closing type, steel with satin finish.
  - 1. Manufacturers:
    - a. Grass America Inc: [www.grassusa.com](http://www.grassusa.com).
    - b. Hardware Resources: [www.hardwareresources.com](http://www.hardwareresources.com).
    - c. Julius Blum, Inc: [www.blum.com](http://www.blum.com).
    - d. Substitutions: See Section 01600 - Product Requirements.

## **2.08 FABRICATION**

- A. Cabinet Style: Flush overlay.
- B. Cabinet Doors and Drawer Fronts: Flush style.
- C. Drawer Construction Technique: Dovetail joints.
- D. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- E. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- F. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
  - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
  - 2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- G. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal cut edges.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

### **3.02 INSTALLATION**

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets and counter bases to floor using appropriate angles and anchorages.

### **3.03 ADJUSTING**

- A. Test installed work for rigidity and ability to support loads.
- B. Adjust moving or operating parts to function smoothly and correctly.

### **3.04 CLEANING**

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION**

## SECTION 07200

### **BUILDING INSULATION**

#### PART 1 - GENERAL

##### 1.01 RELATED DOCUMENTS

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

##### 1.02 DESCRIPTION OF WORK

- A. Work described in this section includes insulation of the following types in the area of the build-out.

- 1. Sound attenuation blankets. (un-faced fiber blanket/batts) (full height)

- B. Related work specified elsewhere includes:

- 09250: Gypsum Board Assemblies

##### 1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide batt insulation of the following R-values at the locations indicated:

- 1. Interior Walls: As indicated on Drawings. (sound attenuation blankets).

##### 1.04 QUALITY ASSURANCE

- A. Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by r-values they represent the rate of heat flow through a homogenous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

- 1. Where insulation is indicated by "R" value, provide thickness required to achieve indicated value.

- B. Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

- 1. Surface Burning Characteristics: ASTM E 84.

- 2. Fire Resistance Ratings: ASTM E 119.

- 3. Combustion Characteristics: ASTM E 136.

##### 1.05 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.

##### 1.06 DELIVERY AND STORAGE

- A. General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

## PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

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

- 1. Manufacturers of Glass Fiber Insulation:

- CertainTeed Corp.
  - Manville Corp.
  - Owens-Corning Fiberglas Corp.

### 2.02 INSULATION MATERIALS

- A. General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.
  - 1. Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths and lengths.
- C. Sound Attenuation Blankets: Use R-11 flexible Glass-fiber board insulation for sound attenuation. (at interior walls)

## PART 3 - EXECUTION

### 3.01 INSPECTION AND PREPARATION

- A. Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.
- B. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.

### 3.02 INSTALLATION, GENERAL

- A. Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with work.
- B. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness. Install facings in contact with finish materials. Protect from open flame or other heat source.

### 3.03 INSULATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated use mechanical anchorage to provide permanent placement and support of units.
- B. Install batt insulation as indicated on the drawings.

#### 3.04 PROTECTION

- A. General: Protect installed insulation from harmful weather exposures and from possible physical abuses, where possible nondelayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

## SECTION 07900

### JOINT SEALERS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

- A. Work described in this section includes joint sealer systems.
- B. Related work specified elsewhere includes:
  - 03300: Structural Cast-in-Place Concrete
  - 09250: Gypsum Drywall
  - 09900: PaintingDIVISIONS 15 and 16: Joint sealers for mechanical and electrical work.

##### 1.02 SYSTEM PERFORMANCES

- A. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

##### 1.03 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an Installer who has successfully completed within the last three years at least 3 joint sealer applications similar in type and size to that of this project and who will assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.
- B. Single Source Responsibility for Joint Sealer Materials: Obtain joint sealer materials from a single manufacturer for each different product required.

##### 1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications, handling/ installation/curing instructions, color charts and performance tested data sheets for each product required.

##### 1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multicomponent materials.
- B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

##### 1.06 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealers under the following conditions:
  - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealer manufacturer or below 40°F.
  - 2. When joint substrates are wet due to rain, frost, condensation or other causes.

- B. Joint Width Conditions: Do not proceed with installation of joint sealers when joint widths are less than allowed by joint sealer manufacturer for application indicated.

## PART 2 - PRODUCTS

### 2.01 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealers, 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 testing and field experience.
- B. Colors: Provide color of exposed joint sealers indicated or, if not otherwise indicated, as selected by Contracting Officer from manufacturer's standard colors.

### 2.02 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.
- B. Single-Part Neutral-Curing Silicone Sealant: Type S, Grade NS, Class 25, Uses NT, M, G, A, and O.
1. Additional Movement Capability: Provide products with capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand +100%/-50% change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for Uses indicated.
  2. Products: Subject to compliance with requirements, provide one of the following:  
"790," Dow Corning.  
"Spectrem 1," Tremco, or equal.
  3. Locations for Use: Exterior joints in vertical surfaces of concrete and masonry; between metal and concrete, mortar or masonry; overhead or ceiling joints; perimeters of metal frames in exterior walls; and at all miscellaneous locations requiring a joint sealant.
- C. Two-Part Pourable Urethane Sealant: Type M, Grade P, Class 25; Uses T, M, A and, as applicable to joint substrates indicated, O.
1. Products: Subject to compliance with requirements, provide one of the following:  
"Chem-Calk 550"; Bostik Construction Product Div.  
"Vulkem 245"; Mameco International, Inc.  
"Pourthane"; W. R. Meadows, Inc.  
"NR-200 Urexpan"; Pecora Corp.  
"Sonolastic Paving Joint Sealant"; Sonneborn Building Products Div., Rexnord Chem. Prod. Inc.  
"THC-900"; Tremco Corp.
  2. Locations for Use: Exterior and interior joints in horizontal surfaces subject to pedestrian and light vehicular traffic.
- D. One-Part Mildew-Resistant Silicone Sealant: Type S, Grade NS; Class 25, Uses NT, G, A and, as applicable to nonpourous joint substrates indicated, O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic tile, showers, sinks and plumbing fixtures.

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

"Dow-Corning 786"; Dow Corning Corp.  
"SCS 1702"; General Electric.  
"863 #345 White"; Pecora Corp.  
"Proglaze White"; Tremco Corp.

2. Locations for Use: Interior joints in vertical surfaces of tile; and joints at damp areas, such as around sinks and plumbing fixtures.

### 2.03 LATEX JOINT SEALERS

- A. Acrylic-Emulsion Sealant: Manufacturer's standard, one part nonsag, acrylic, mildew resistant, acrylic emulsion sealant complying with ASTM C 834, formulated to be paintable and recommended for exposed applications on interior and on protected exterior exposures involving joint movement of not more than +7.5%.

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

"Chem-Calk 600"; Bostik Construction Products Div.  
"AC-20"; Pecora Corp.  
"Sonolac"; Sonneborn Building Products Div; Rexnord Chemical Prod., Inc.  
"Tremco Acrylic Latex Caulk"; Tremco Inc.

2. Locations for Use: Interior joints in field-painted vertical and overhead surfaces at perimeter of hollow metal door frames, gypsum drywall, plaster and concrete or concrete masonry; and all other interior locations not indicated otherwise.

### 2.04 FIRE-RESISTANT JOINT SEALERS

- A. General: Provide manufacturer's standard firestopping sealant, with accessory materials, having fire-resistance ratings indicated as established by testing identical assemblies per ASTM E 814 by Underwriters Laboratory, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction. Sealant shall be asbestos-free.

- B. One-Part Firestopping Sealant: One part elastomeric sealant formulated for use in a through-penetration firestop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors.

- C. Products: Subject to compliance with requirements, provide one of the following:

"Dow Corning Fire Stop Sealant"; Dow Corning Corp.  
"3M Fire Barrier Caulk CP-25"; Electrical Products Div./3M.  
"RTV 7403"; General Electric Co.  
"Fyre Putty"; Standard Oil Engineered Materials Co.

### 2.05 ACOUSTICAL SEALANT

- A. 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.

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

"OSI Acoustical Sound Sealant (Rubber Base)"; Ohio Sealant, Inc.  
"PTI Acoustical Sealant 808"; Protective Treatments, Inc.

"Tremco Acoustical Sealant"; Tremco, Inc."

2. Locations for Use: All interior partitions (at top and bottom runners and at penetrations), at top edge of perimeter edge trim of acoustical ceilings and elsewhere as indicated.

## 2.06 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material and type which are non-staining; 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, non-waxing, non-extruding strips of 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. Backer Rod: Premium grade, closed cell polyethylene foam rod; Sealtight Backer Rod, as manufactured by W.R. Meadows, Inc., or approved equal.
  2. Joint Filler: "Ceramar" flexible foam expansion joint filler, as manufactured by W.R. Meadows, Inc., or approved equal.
- C. Bond Breaker Tape: Polyethelene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back (3rd) surface of joint. Provide self-adhesive tape where applicable.

## 2.07 MISCELLANEOUS MATERIALS

- A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.
- B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
- C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surface adjacent to joints.
- D. Accessory Materials for Firestopping Sealants: Provide forming, joint fillers, packing and other accessory materials required for installation of firestopping sealants as applicable to installation conditions indicated. Accessory materials shall be asbestos-free.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Require Installer to inspect joints indicated to receive joint sealers for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Obtain Installer's written report listing any conditions detrimental to performance of joint sealer work. Do not allow joint sealer work to proceed until unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; 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, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. 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 non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealers.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer 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 which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.03 INSTALLATION OF JOINT SEALERS

- A. General: Comply with joint sealer manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply. The application of sealants will strictly follow the recommendations sealant manufacturer. Disposal of residues will adhere to the provisions of the Resource Recovery Act and/or military installation policy, whichever is more strict. At all times OSHA PEL limits and precautions will be followed.
- B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 962 for use of joint sealants as applicable to materials, applications and conditions indicated.
- C. Latex Sealant Installation Standard: Comply with requirements of ASTM C 790 for use of latex sealants.
- D. 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.
1. Application at Bottom Runners: Apply round bead of sound sealant at each side of runners before setting gypsum board. Gypsum board shall be set into sealant to form complete contact with adjacent materials.
  2. Application at Top Runners: Apply sealant at top of gypsum board in manner to provide full contact between gypsum board and structure above.
  3. Application at Cut Outs in Gypsum Board: Backs of electrical boxes, pipes, and other equipment penetrating wall surface shall be buttered with sealant and perimeter edges of all items sealed with sealant.
- E. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint-fillers of type indicated or recommended by sealant manufacturer to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.
    - 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 which have become wet prior to sealant application and replace with dry material.
  2. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.
- F. 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 which allow optimum sealant movement capability.
- G. 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 which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
1. Concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.
- H. Installation of Firestopping Sealant: Install sealant, including forming, packing, and other accessory materials to fill openings around mechanical and electrical services penetrating floors, walls and ceilings to provide firestops with fire-resistance ratings indicated for floor, wall or ceiling assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

### 3.04 PROTECTION AND CLEANING

- A. Protect joint sealers 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 sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.
- B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.
1. Sound sealant shall not be visible on exposed surfaces.

END OF SECTION

## **SECTION 08110**

### **STEEL FRAMES**

#### **PART 1 - GENERAL**

##### **1.01 RELATED DOCUMENTS**

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

##### **1.02 SUMMARY**

- A. This Section includes the following products manufactured in accordance with SDI Recommended Standards:

- 1. Frames: Pressed steel frames for doors, interior, openings of following type:
  - a. Drywall Slip-On type.

- 2. Provide frames to be field painted.

- B. Related work specified elsewhere includes:

08211: Flush Wood Doors  
08710: Finish Hardware  
09250: Gypsum Drywall  
09900: Painting

##### **1.03 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- C. Shop drawings showing fabrication and installation of standard steel doors and frames. Include details of each frame type, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
  - 1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.

##### **1.04 QUALITY ASSURANCE**

- A. Provide frames complying with Steel Door Institute "Recommended Specifications - Standard Steel Doors and Frames" ANSI/SDI-I00 and as herein specified.

## I.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver frames cardboard-wrapped or crated to provide protection during transit and job storage.
- B. Inspect frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Contracting Officer; otherwise, remove and replace damaged items as directed.
- C. Store frames at building site under cover. Place units on minimum 4-inch-high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber.

## PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide standard steel doors and frames by one of the following:
  - 1. Standard Steel Frames:
    - Amweld Building Products, Inc.
    - Bymoco Metal Fabricators, Inc.
    - Ceco Corp.
    - Copco Door Co.
    - Curries Company.
    - Fenestra Corp.
    - Kewanee Corp.
    - Mesker Door Co.
    - Pioneer Industries.
    - Premier Products, Inc. (Formerly Dittco).
    - Republic Builders Products.
    - Steelcraft Manufacturing Co.

### 2.02 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.
- B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, or drawing quality, ASTM A 642, hot dipped galvanized in accordance with ASTM A 525, with A60 or G60 coating designation, mill phosphatized.
- D. Supports and Anchors: Fabricate of not less than 1/8-gage sheet steel; galvanized where used with galvanized frames.
- E. Inserts, Bolts and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.
- F. Shop Applied Paint: Apply after fabrication.

1. Primer: Rust-inhibitive enamel or paint, either air drying or baking, suitable as a base for specified finish paints, complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

## 2.03 FRAMES

- A. Provide metal frames for doors of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gauge cold-rolled steel.
  1. Fabricate frames with knocked-down for field assembly at slip-on drywall frames.
- B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single door frames and 2 silencers on heads of double door frames. Provide "GJ64" silencers as manufactured by Glenn-Johnson Corp., or equal.
- C. Plaster Guards: Provide minimum 26-gage steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

## 2.05 FABRICATION

- A. Fabricate steel frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI-100 requirements.
- B. Tolerances: Comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- C. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.
- D. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- E. Hardware Preparation: Prepare frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.
  1. Install magnetic door switches in accordance with manufacturer's recommendations and approved shop drawings.
- F. Reinforce frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.
- G. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.

- H. Shop Painting: Clean, treat and paint exposed surfaces of steel frame units, including galvanized surfaces, but excluding stainless steel surfaces.
  - 1. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint.
  - 2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. General: Install standard steel frames and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.
- B. Placing Frames: Comply with provisions of SDI-I05 "Recommended Erection Instructions for Steel Frames," unless otherwise indicated.
  - 1. Except for frames located at existing concrete, masonry, or drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
  - 2. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws.
  - 3. In in-place drywall partitions install knock down slip-on drywall frames.
- C. Door Installation: Fit solid core wood doors accurately in frames, within clearances specified in ANSI/SDI-I00.
  - 1. Install silencers after all painting of frames has been completed and has dried.

#### 3.02 ADJUST AND CLEAN

- A. Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Final Adjustments: Check and readjust operating hardware items, leaving steel frames undamaged and in complete and proper operating condition.

**END OF SECTION**

## SECTION 08211

### FLUSH WOOD DOORS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

A. Work described in this section includes flush wood doors with plastic laminate veneer faces..

B. Related work specified elsewhere includes:

08110: Steel Frames

08710: Finish Hardware

09900: Painting

##### 1.02 SUBMITTALS

A. Product Data: Submit door manufacturer's technical data for each type of door, including details of core and edge construction, and trim for openings and louvers.

B. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, and other pertinent data.

##### 1.03 QUALITY ASSURANCE

A. Quality Standards: Comply with the following standards:

1. NWWDA Quality Standard: I.S.1 "Industry Standard for Wood Flush Doors", of National Wood Window and Door Association (NWWDA).

2. AWI Quality Standard: "Architectural Woodwork Quality Standards", including Section 1300 "Architectural Flush Doors", of Architectural Woodwork Institute (AWI) for grade of door, core construction, finish and other requirements exceeding those of NWWDA quality standard.

B. NWWDA Quality Marking: Mark each wood door with NWWDA Wood Flush Door Certification Hallmark certifying compliance with applicable requirements of NWWDA I.S.I Series.

1. For manufacturers not participating in NWWDA Hallmark Program, a certification of compliance may be substituted for marking of individual doors.

C. Manufacturer: Obtain doors from a single manufacturer.

##### 1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of NWWDA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors" as well as with manufacturer's instructions.

B. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

##### 1.05 PROJECT CONDITIONS

**BRYAN VILLAGE SHOPPETTE IMAGE UPGRADE**

**FT. STEWART, GEORGIA** / PWBA 110803

AAFES PROJECT NUMBER 0756-10-000007

**FLUSH WOOD DOORS**

08211 - 1

- A. Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the following requirements applicable to project's geographical location:

- 1. Referenced AWI quality standard including Section 100-S-3 "Moisture Content".

#### 1.06 WARRANTY

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the Government may have under the Contract Documents.
- B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup or twist), or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced quality standards.
  - 1. Warranty shall also include refinishing and reinstallation which may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
  - 2. Warranty shall be in effect during following period to time after date of Substantial Completion.
    - a. Solid Core Interior Doors: Life of installation.
- C. Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. High Pressure Decorative Laminate Faced Doors:
  - 1. Algoma Hardwoods, Inc: [www.algomahardwoods.com](http://www.algomahardwoods.com).
  - 2. Ampco Products, Inc: [www.ampco.com](http://www.ampco.com).
  - 3. Eggers Industries; [www.eggersindustries.com](http://www.eggersindustries.com).
  - 4. Marshfield Door Systems, Inc: [www.marshfielddoors.com](http://www.marshfielddoors.com).
  - 5. Poncraft Door Co: [www.poncraft.com](http://www.poncraft.com).
  - 6. VT Industries, Inc: [www.vtindustries.com](http://www.vtindustries.com).
  - 7. Substitutions: See Section 01600 - Product Requirements.

#### 2.02 DOORS

- A. All Doors:
  - 1. Quality Level: Custom Grade, in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1300.
  - 2. High Pressure Decorative Laminate 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 all locations.
  - 2. High pressure decorative laminate finish.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine installed door frames prior to hanging door:
  - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
  - 2. Reject doors with defects.

### 3.02 INSTALLATION

- A. Hardware: For installation see Section 8710 - FINISH HARDWARE of these specifications.
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.
- C. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
  - 1. Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4" clearance from bottom of door to top of threshold.
  - 2. Bevel non-rated doors 1/8" in 2" at lock and hinge edges.
- D. Prefit Doors: Fit to frames for uniform clearance at each edge.
- E. Field-Finished Doors: Refer to Section 09900 - PAINTING for requirements for finishing wood doors.

### 3.03 ADJUSTING AND PROTECTION

- A. Operation: Rehang or replace doors which do not swing or operate freely.
- B. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

## SECTION 08385

### DOUBLE-ACTING TRAFFIC DOORS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Double-acting self-closing swinging traffic doors.
- B. Door accessories.
- C. Door frames.

##### 1.02 RELATED REQUIREMENTS

- A. Section 08710 - Door Hardware: Wall-mounted door stops.

##### 1.03 SUBMITTALS

- A. See Section 01300 - 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. See Section 01720 - Project Record and Closeout Documents, for additional warranty requirements.
- B. Provide two year manufacturer warranty for molded polyethylene doors against damage due to worker-ridden vehicle traffic; state limitations in executed warranty.

#### PART 2 PRODUCTS

##### 2.01 RIGID AND SEMI-RIGID TRAFFIC DOORS

- A. Thermoplastic Double-Acting Traffic Doors: Hollow core thermoplastic with or without urethane foam fill.
  - 1. Thickness: 1-1/2 inches.
  - 2. Faces: 1/8 inch minimum thickness; textured or pebble finish.
  - 3. Construction: Manufacturer's standard construction with faces bonded to thermoplastic or aluminum subframe or molded in one piece, reinforced for durability and rigidity, with all edges, cut-outs, and hardware preparations factory fabricated; provide view window cut-outs with joints sealed independently of glazing or trim.
  - 4. Hardware Preparations: Factory reinforce, machine, and prepare for all hardware including field installed items; provide solid blocking for each hardware item; make field cutting, drilling or tapping unnecessary.
  - 5. Gaskets: Replaceable rubber gaskets in key on edge of door.
  - 6. Impact Plates: Provide scuff plates on both sides of doors.
  - 7. Color: As selected by Contracting Officer's Authorized Representative from manufacturer's standard selection.
  - 8. Manufacturers:
    - a. Chase Doors: [www.chasedoors.com](http://www.chasedoors.com).
    - b. Eliason Corporation: [www.eliasoncorp.com](http://www.eliasoncorp.com).
    - c. Rubbair Door, Inc: [www.rubbair.com](http://www.rubbair.com).
    - d. Substitutions: See Section 01600 - Product Requirements.
- B. Door Assemblies: Provide double-acting, self-closing pairs of doors; factory fabricated and finished, complete with hinges and specified accessories.
  - 1. Door Swing: Minimum of 120 degrees each direction.
  - 2. Hinges: V-cam gravity hinges at top and pivots at bottom; mounted on bottom of header and on top of floor; maximum rise 1-1/2 inches; vertical and horizontal adjustment in the field; manufacturer's standard lower hinge guards.
  - 3. Hinge Guards: Manufacturer's standard material and configuration, to protect lower hinges from damage.
  - 4. Exposed Metal Parts: Either stainless steel, extruded aluminum, or powder coated.
  - 5. Where gaskets are specified, provide on all four edges of door.
  - 6. View Windows: Provide view window in each door panel unless otherwise indicated, centered in door width, and 48 inches, maximum, from finish floor to bottom of viewing area.
  - 7. Dimensional Tolerances: Plus or minus 1/4 inch in width and height of each panel.
- C. View Windows: Factory installed glazing in molded or extruded black thermoplastic or rubber gasket; centered in door width; use single glazing unless otherwise indicated.
  - 1. Square-Shaped Window Size: 12 inches by 16 inches.
  - 2. Single Glazing: Acrylic glazing sheet, 1/4 inch thick, clear.
- D. Door Gaskets: Manufacturer's standard configuration.
  - 1. Thermal Gaskets: 55 to 70 durometer extruded black santoprene.
  - 2. Other Gaskets: Santoprene or PVC.
- E. Impact Plates: Surface applied; factory installed.
  - 1. Scuff Plates: 30 inches high by full width of door panel, mounted at bottom of door.
  - 2. Push Plates: 12 inches high by 12 inches wide, mounted at leading edge of door with centerline at 48 inches above floor.
  - 3. Stainless Steel: Type 304, with No.4 brushed satin finish; 18 gage 0.05 inch thick.

## **2.02 ACCESSORY COMPONENTS**

- A. Frames: Provide doors pre-hung in frames by door manufacturer; tubular steel welded frame.
- 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 Authorized 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.

### **3.03 INSTALLATION**

- A. Install doors with clearances, anchors, hardware, and accessories according to the manufacturer's instructions and as specified.
- B. 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 PROTECTION**

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Protect installed products until completion of project.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

## SECTION 08710

### FINISH HARDWARE

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDES

- A. The work in this section shall include the furnishings of all items of finished hardware as hereinafter specified, or obviously necessary to complete the building, except those items which are specifically excluded from this section of the specification.
- B. Related work specified elsewhere includes:
  - 08110: Steel Frames
  - 08211: Flush Wood Doors

##### 1.02 DEFINITIONS

- A. Finish Hardware: Hardware used in building construction but particularly that used on or in connection with doors, frames, cabinets and other movable members. It also has a finished appearance as well as functional purpose and may be considered as a part of the decorative treatment of a room or building.

##### 1.03 QUALITY ASSURANCE

- A. Hardware has been specified herein by manufacturers' name, brand and catalog numbers for the purpose of establishing a basis for quality, finish, design and operational function. No other products shall be furnished unless approved by means described below. All hardware shall comply with NFPA 101 (2003) and NFPA 80 (1999)
- B. To insure a uniform basis of acceptable materials, it is the intention that only manufacturer's items specified as "acceptable and approved" be furnished for use on this project.
- C. Deviation from or modification of items will be permitted only for special instances caused by reason of construction characteristics and for the purpose of providing proper operational function. The contractor shall be responsible for checking any necessary deviations in order that hardware shall fit and function properly.
- D. Substitutions: Request for substitutions of items of hardware other than those listed as "Acceptable and Approved" shall be made to the Contracting Officer no later than ten (10) days prior to bid opening. Approval of substitutions will only be by addendum. Request for substitutions shall be accompanied by samples and/or detailed information for each manufacturer of each product showing design, functions, material thickness and any other pertinent information needed to compare product with that specified. Lack of this information will result in a refusal.
- E. Supplier: A recognized builders hardware supplier who has been furnishing hardware in the project's vicinity for a period of not less than two (2) years, and who is, or has in full time employment an Architectural Hardware Consultant (AHC) in good standing as certified by the Society of Architectural Council or equivalent, and who is a direct distributor of the products approved for warranty purposes. This paragraph will be strictly enforced. All schedules shall be signed by an AHC.

##### 1.04 SUBMITTALS

- A. Hardware Schedules: The finish hardware supplier shall, after award of a formal contract, submit to the Contracting Officer, six (6) complete computerized or typewritten (handwritten are not acceptable) copies of the proposed finish hardware schedule for approval. The schedule shall be prepared using the "Sequence and Format" of the Door and Hardware Institute (DHI). After approval of the schedule the hardware supplier shall provide three (3) copies of this approved schedule to the contractor for file and distribution purposes. Hardware shall not be ordered by the hardware supplier until an approved schedule has been received. Horizontal schedules will not be acceptable. Provide vertical format.
  - 1. When submitting schedules for approval, include two manufacturers' cut sheets on each hardware item proposed. Index it with the use of numbers or letters or a combination of both, with the hardware schedule. The index numbers/letters are to be in the right hand column on the same line as the respective manufacturer's numbers. All manufacturer's numbers shall be indexed even when appearing more than once.
- B. Templates: The hardware supplier shall provide necessary templates and/or physical hardware to all trades requiring them in order that they may cut, reinforce or otherwise prepare their material or product to receive the hardware item. If physical hardware is required by any manufacturer, the hardware supplier shall ship to them such hardware via prepaid freight in sufficient time to prevent any delay in the execution of their work.

#### 1.05 DELIVERY, STORAGE AND HANDLING

- A. All items of hardware to be delivered to the jobsite shall be completely packaged with all necessary screws, bolts, miscellaneous parts, instructions and where necessary installation templates for manufacturer's suggested installation. All boxes are to have a typed label with door hand, room location, item number and keying to conveniently identify them and their intended location in the building.
- B. A representative of the general contractor shall receive the hardware when delivered at the jobsite. A dry locked storage space complete with shelving, shall be set aside for the purpose of unpacking, sorting, checking and storage.
- C. Finish hardware shall be delivered to the general contractor by the hardware supplier. Direct factory shipments to the jobsite are not acceptable.
- D. The hardware shall be jointly inventoried by representatives of the general contractor and the hardware supplier.
- E. Items damaged in shipment shall be replaced promptly and with proper material without additional cost to the general contractor.
- F. All hardware shall be handled in a manner to minimize marring, scratching or damage.

#### 1.06 WARRANTY

- A. All hardware shall have a one year warranty except door closers which shall have a five or ten year warranty as applicable for the closer specified.

### PART 2 - PRODUCTS

#### 2.01 GENERAL

- 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.

## 2.02 FINISH OF HARDWARE

- A. Finish of items shall be as listed in the hardware schedule and shall conform to ANSI A156.18 unless otherwise specified.

## 2.03 HINGES AND PIVOTS

- A. Template Hinges: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template hinges which conform to ANSI whenever applicable.
- B. Hinge pins, except as otherwise indicated, shall be as follows:
  - 1. Steel Hinges: Steel pins.
  - 2. Non-Ferrous Hinges: Stainless steel pins.
  - 3. Out-swing Corridor Doors: Non-removable pins (NRP), whether specified in the hardware sets or not.
  - 4. Interior Doors: Non-rising pins.
  - 5. Tips: Flat button and matching plug, finished to match leaves.
- C. Where projection of door trim is such as to prevent desired degree of opening, the proper hinge width shall be provided to allow the door to clear the trim.
- D. Manufacturer: Equal to the following:
  - Stanley
  - Hager
  - McKinney

## 2.04 KEYS AND KEYING

- A. Provide construction cores and keys during the construction period. Construction control and operating keys and cores shall not be part of the AAFES permanent keying system or furnished on the same keyway as the AAFES permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the AAFES prior to occupancy. The hardware manufacturer must coordinate with locksmith in reference to keying codes for the interchangeable cores.
- B. All cylinders shall be Best 7-Pin, interchangeable core and keyed into a new factory registered grand masterkey system with a restricted keyway.
- C. Grand masterkeys, masterkeys and other security keys shall be transmitted to AAFES by registered mail, return receipt requested.
- D. All keys shall be of nickel-silver material. Supply keys in the following quantities:
  - 2 each Grandmaster Keys
  - 5 each Master Keys
  - 6 each Construction Master Keys
  - 2 each Change Keys per Keyed Core
  - 2 each Control Keys

- E. Supply one Lund "Deluxe" series wall mounted key cabinet with two tag key system (150% capacity) to be mounted where directed by Contracting Officer.

## 2.05 LOCKSETS & LATCHSETS

- A. Manufacturer/Design: Best Lock Corporation 35H/93K Series, 14J/14D designs, or approved equal.
- B. Lever Trim: Best design number "14" or approved equal. All levers shall be solid. Supply escutcheons at all exterior openings equal to Best type "J", forged or cast. Supply rose at interior openings equal to Best "D" Rose.
- C. All mortise locksets shall be supplied with one inch throw deadbolts and 3/4" throw three-piece anti-friction latch bolts.
- D. Locksets shall be Best removable core cylinders with no exceptions.
- E. Supply mortise locksets at all exterior openings.

## 2.06 OVERHEAD CLOSERS

- A. Accepted and approved as follows:  
  
Corbin 120/390E Series  
LCN 4040/1460 Series
- B. All closers shall be mounted on interior side of rooms.
- C. Closers with aluminum bodies will be accepted. All closers shall have full covers.

## 2.07 FLAT GOODS

- A. Accepted and approved as follows:  
  
Rockwood  
Ives  
Trimco  
Hager Accent Trim
- B. It is the responsibility of the hardware supplier to provide proper screw attachments per wall or floor conditions for door stops.
- C. Provide stops for each and every interior and exterior opening. All interior door stops shall be floor mounted, unless otherwise indicated. Provide risers at carpet installations.
- D. Kickplates and armor plates shall be equal to "Rockwood" Series 190 and shall be mounted by sheet metal screws where indicated in hardware sets, unless specified otherwise in hardware sets.
- E. Where stainless steel plates are specified, metal shall be .050" thickness. Plates shall be beveled on all (4) edges.

## 2.08 THRESHOLDS AND WEATHERSTRIPPING

- A. Accepted and approved as follows:

National Guard  
Pemko  
Hager Barrier Seal Systems  
Zero

## 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 and wood doors and frames by the Door Hardware Institute (DHI), except if otherwise specifically indicated or to comply with requirements of governing regulations, requirements for the handicapped, or if otherwise directed by the Contracting Officer.
- B. Degree of opening for doors with overhead holders, closers, etc., shall be included in the hardware schedule for the Contracting Officer's approval.
- C. All hardware shall be installed by tradesmen skilled in the application of commercial grade hardware.
- D. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Securely fasten all parts to be attached. Fit faces of mortised parts snug and flush. Make sure all operating parts move freely and smoothly without binding, sticking or excessive clearance. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted and finished in another way, the hardware shall be removed and stored prior to the painting or finishing. Items shall then be reinstalled only when the finishes have been completed on the surface to which the hardware is to be applied.
- E. At exterior doors and elsewhere as indicated, set thresholds in a bed of sealant as specified in Section 07900 to completely fill concealed voids and exclude moisture from every source. Do not plug drain holes or block weeps. Remove excess sealant.
- F. After installation, representative templates, instruction sheets and installation details shall be placed in a file folder to be turned over to the AAFES when the building is accepted. Included shall be at least five each of any special adjusting and/or installation tools furnished with the hardware by the manufacturers.

### 3.02 ADJUSTING AND CLEANING

- A. Adjust and check each operating item of hardware to ensure correct operation and function. Units which cannot be adjusted to operate as intended for the application made shall be replaced.
- B. Final Adjustment: Wherever hardware installation is made more than one month prior to building acceptance or occupancy of a space of area, the installer shall return to the work during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items. Hardware shall be cleaned as necessary to restore correct operation, function and finish. Door control devices shall be adjusted to compensate for final operation of heating and ventilating equipment.

### 3.03 PROTECTION

- A. Whenever hardware is located in areas where it may be subject to damage during construction by handling, cleaning, etc., (e.g. painting) it shall be protected and/or removed from its location until the hazardous condition is terminated.

### 3.04 GENERAL NOTES

- A. Before the installation of any hardware the Contractor's installer shall contact the hardware supplier to discuss any special installation requirements for all hardware items. Their discussion shall include, but not be limited to, such items as proper closer mounting, proper fasteners to be used for hardware, lockset and exit device backsets, etc.
- B. Electric power tools shall not be used on hardware fasteners so as to prevent damage to screw heads.
- C. Hex nut bolts shall not be used for mounting door closers or exit devices on hollow metal doors. Doors shall be drilled and tapped in reinforced areas for installation.
- D. Hardware supplier shall verify all quantities indicated in the following schedule.

### 3.05 HARDWARE SETS

EXTERIOR DOORS AND TOILET DOORS ARE TO REMAIN AS EXISTING

#### **HARDWARE SET 1**

Doors 104 and 106

Each to have:

3 Hinges	TA2714	US26D	MC
1 Storeroom Lock	10G04 LL	US26D	SA
1 Latch Set	10U65 LL	US26D	SA
1 Door Stop	WS02/FS01 as required	US26D	MC
3 Door Silencers	S1M		

**END OF SECTION**

## SECTION 08800

### GLAZING

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Glass.
- B. Laminated glass.
- C. Insulating glass units.
- D. Glazing compounds and accessories.

##### 1.02 RELATED REQUIREMENTS

- A. Section 08110 - Steel Doors and Frames: Glazed doors and frames.
- B. Section 08211 - Flush Wood Doors: Glazed doors.
- C. Section 08910 - Metal Framed Curtain Wall.
- D. Section 10800 - Toilet, Bath, and Laundry Accessories: Mirrors.

##### 1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
- B. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- C. ASTM C 1036 - Standard Specification for Flat Glass.
- D. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
- E. ASTM C 1193 - Standard Guide for Use of Joint Sealants.
- F. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
- G. GANA (GM) - GANA Glazing Manual; Glass Association of North America.
- H. GANA (SM) - FGMA Sealant Manual; Glass Association of North America.
- I. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units; Sealed Insulating Glass Manufacturers Association.
- J. Department of Defense (DoD), Unified Facilities Criteria (UFC) 4-010-01, Para B-3.1, Standard 10
- K. ASCE, Standard 7; 140 MPH @ 3-Second Gust.

##### 1.04 SUBMITTALS

- A. See Section 01300 - Submittals, for submittal procedures.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

## **1.05 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA Glazing Manual, FGMA Sealant Manual, and SIGMA TM-3000 Glazing Guidelines for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

## **1.06 FIELD CONDITIONS**

- A. Do not install glazing when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

## **1.07 WARRANTY**

- A. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
- B. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.

## **PART 2 PRODUCTS**

### **2.01 GLAZING TYPES**

### **2.02 GLASS MATERIALS**

- A. Float Glass Manufacturers:
  - 1. Zeledyne: [www.versaluxglass.com](http://www.versaluxglass.com).
  - 2. AGC Flat Glass North America, Inc: [www.afgglass.com](http://www.afgglass.com).
  - 3. Pilkington North America Inc: [www.pilkington.com](http://www.pilkington.com).
  - 4. PPG Industries, Inc: [www.ppg.com](http://www.ppg.com).
  - 5. Visteon Glass Systems: [www.visteon.com/floatglass](http://www.visteon.com/floatglass).
  - 6. Substitutions: Refer to Section 01600 - Product Requirements.
- B. Float Glass: All glazing is to be float glass unless otherwise indicated.
  - 1. Annealed Type: ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
  - 2. Heat-Strengthened and Fully Tempered Types: ASTM C 1048.
  - 3. Tinted Types: Color and performance characteristics as indicated.
  - 4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
- C. Safety Glass (Glazing Type 2): Clear; fully tempered.
  - 1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
  - 2. Comply with 16 CFR 1201 test requirements for Category II.
  - 3. Where glazing is to be installed in fire-rated partition, provide glazing that is also fire-protection rated in accordance with applicable code.
  - 4. 6 mm minimum thick.
  - 5. Provide this type of glazing in the locations required by code.
  - 6. 5/16 inch thick minimum.
  - 7. Visible light transmittance of 69 percent, shading coefficient of 0.44.
  - 8. Product: Equivalent to "Solarban 60 Clear" as manufactured by PPG Industries, Inc.

- D. Laminated Glass: Comply with ASTM C 1172. Department of Defense (DoD), Unified Facilities Criteria (UFC) 4-010-01, Para B-3.1, Standard 10
  - 1. Outer pane: 1/8 inch thick, clear heat-strengthened glass.
  - 2. Inner pane: 1/8 inch thick, clear heat-strengthened glass.
  - 3. Laminated with 0.060 inch thick clear plastic interlayer.
  - 4. Overall Thickness: 5/16 inch.

### **2.03 SEALED INSULATING GLASS UNITS**

- A. Manufacturers:
  - 1. Any of the manufacturers specified for float glass. Materials with approved Florida Product Number will be authorized.
  - 2. Guardian Industries Corporation: [www.guardian.com](http://www.guardian.com).
  - 3. Interpane Glass Company: [www.interpane.com](http://www.interpane.com).
  - 4. Viracon, Apogee Enterprises, Inc: [www.viracon.com](http://www.viracon.com).
  - 5. Substitutions: Refer to Section 01600 - Product Requirements.
- B. Insulated Glass Units: Double pane with glass to elastomer edge seal.
  - 1. Clear Units: Outer pane of Bronze low E glass, inner pane of clear glass.
  - 2. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
  - 3. Clear Units (Glazing Type 1):
    - a. Outer Panel: 1/4 inch thick tempered clear glass.
    - b. Inner Panel: 5/16 inch thick clear laminated glass.
    - c. U factor = .27
    - d. SHGC = .25
  - 4. Purge interpane space with dry hermetic air.
  - 5. Total unit thickness of 1 inch minimum.
- C. Edge Seal Construction: Aluminum, bent and soldered corners.
- D. Edge Seal Material: Clear anodized aluminum color.

### **2.04 GLAZING COMPOUNDS**

- A. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25 with additional movement capability of 100 percent in extension and 50 percent in compression (total 150 percent); Uses M, A, G and O as applicable; cured Shore A hardness of 15 to 25; color as selected.
  - 1. Product: Equivalent to Dow Corning 790.

### **2.05 GLAZING ACCESSORIES**

- A. Setting Blocks: EPDM, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
- B. Spacer Shims: Elastomeric, Shore A durometer hardness required by glass manufacturer to maintain glass lites for installation method used, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal; size as required.
- D. Glazing Gaskets: Resilient EPDM rubber extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I; black color.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

### **3.02 PREPARATION**

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

### **3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)**

- A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

### **3.04 CLEANING**

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

### **3.05 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

**END OF SECTION**

## SECTION 08910

### METAL-FRAMED CURTAIN WALL

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Aluminum-framed glazed curtain wall designed for blast resistance.
- B. Perimeter sealant.

##### 1.02 RELATED REQUIREMENTS

- A. Section 05120 - Structural Steel: Steel attachment members.
- B. Section 05500 - Metal Fabrications: Steel attachment devices.
- C. Section 08800 - Glazing.

##### 1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association.
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association.
- D. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers.
- E. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.
- F. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- G. ASTM B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric].
- H. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- I. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- J. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
- K. IBC 2009 - International Building Code; 2009.
- L. SSPC-Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings.
- M. UFC 4-010-01 - Department of Defense (DoD) Unified Facilities Criteria (UFC) - Minimum Antiterrorism Standards for Buildings; 2007.

##### 1.04 PERFORMANCE REQUIREMENTS

**BRYAN VILLAGE SHOPPETTE IMAGE UPGRADE**  
**FT. STEWART, GEORGIA / PWBA 110803**

AAFES PROJECT NUMBER 0756-10-000007

METAL FRAMED CURTAIN WALL

08910 - 1

- A. Design and size components to withstand the following load requirements without damage or permanent set:
  - 1. Design Blast Loads: Comply with requirements of ASCE 7 and Department of Defense Antiterrorism Construction Standards, 2007 Edition.
    - a. Uniform Positive Blast Load: 144 lbf/sq ft.
    - b. Uniform Negative Blast Load: 144 lbf/sq ft.
  - 2. Member Deflection: Limit member deflection to 1/160 in any direction, and maximum of 1/2 inch, with full recovery of glazing materials.
  - 3. Measure performance by testing in accordance with ASTM E 330, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
- B. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with IBC 2006 code.
- C. Movement: Accommodate the following movement without damage to components or deterioration of seals:
  - 1. Movement of curtain wall relative to perimeter framing.
  - 2. Deflection of structural support framing, under permanent and dynamic loads.
- D. Thermal Resistance of Framing: R of 2.44.
- E. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 6.24 psf as measured in accordance with ASTM E 283.
- F. Condensation Resistance Factor: CRF of 78 (frame) when measured in accordance with AAMA 1503.1.
- G. Water Leakage: None, when measured in accordance with ASTM E 331 at a test pressure difference of 12 lbf/sq ft.
- H. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
- I. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
- J. Design system to eliminate noises caused by wind and thermal movement, to prevent vibration harmonics, and to prevent "stack effect" in internal spaces.
- K. ASCE Standard 7-05 130MPH @ 3-second gust.

#### **1.05 SUBMITTALS**

- A. See Section 01300 - Submittals, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glazing and infill, internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples illustrating finished aluminum surface and glazing materials.
- E. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations.
  - 1. Curtainwall supplier shall provide a current copy of the DOD standard along with all pertinent engineering design calculations indicating compliance.

- F. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

#### **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the state where this installation is located..
- B. Manufacturer: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

#### **1.08 FIELD CONDITIONS**

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Design Basis: Kawneer North America; [www.kawneer.com](http://www.kawneer.com); Product "1600 Wall System3".
- B. Other Acceptable Manufacturers:
  - 1. United States Aluminum Corp: [www.usalum.com](http://www.usalum.com).
  - 2. Vistawall Architectural Products: [www.vistawall.com](http://www.vistawall.com).
  - 3. YKK AP America Inc.: [www.ykkap.com](http://www.ykkap.com).
  - 4. Substitutions: See Section 01600 - Product Requirements.

#### **2.02 CURTAIN WALL**

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
- B. Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
  - 1. Movement: Accommodate the following movement without damage to components or deterioration of seals:
    - a. Movement of curtain wall relative to perimeter framing.
    - b. Deflection of structural support framing, under permanent and dynamic loads.
  - 2. Water Leakage: None, when measured in accordance with ASTM E 331 at a test pressure difference of 2.86 lbf/sq ft.
  - 3. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

4. Design system to eliminate noises caused by wind and thermal movement, to prevent vibration harmonics, and to prevent "stack effect" in internal spaces.

### **2.03 COMPONENTS**

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
  1. Inside/outside glazed, with pressure plate and mullion cover.
  2. Finish: Class I color anodized.
  3. Color: To match existing
- B. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  1. Framing members for interior applications need not be thermally broken.
  2. Cross-Section: 2-1/2 x 7-1/2 inch nominal dimension.
  3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

### **2.04 MATERIALS**

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M).
- B. Structural Steel Sections: ASTM A 36/A 36M; shop primed.
- C. Structural Supporting Anchors Attached to Structural Steel: Design for bolted or welded attachment.
- D. Fasteners: Galvanized steel.
- E. Concealed Flashings: 0.018 inch thick stainless steel.
- F. Perimeter Sealant: Type specified in Section 07900.
- G. Glazing: As specified in Section 08800.
  1. Glass in Exterior Framing: 1 inch insulating glass as scheduled.
  2. Glass in Interior Framing: 1/4 inch tempered glass.
- H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- I. Glazing Accessories: As specified in Section 08800.
- J. Shop and Touch-Up Primer for Steel Components: SSPC-Paint 25, zinc oxide, alkyd, linseed oil primer.

### **2.05 FINISHES**

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating or AAMA 612 electrolytically deposited colored anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.
- B. Touch-Up Materials: As recommended by coating manufacturer for field application.

### **2.06 FABRICATION**

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.

- D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
- E. Arrange fasteners and attachments to conceal from view.
- F. Reinforce framing members for imposed loads.
- G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
  - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

#### **3.02 INSTALLATION**

- A. Install wall system in accordance with manufacturer's instructions.
- B. Comply with Department of Defense Antiterrorism Construction Standards, current edition.
- C. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- D. Provide alignment attachments and shims to permanently fasten system to building structure.
- E. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- F. Provide thermal isolation where components penetrate or disrupt building insulation.
- G. Install sill and head flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Pressure Plate Framing: Install glazing in accordance with Section 08800, using glazing method required to achieve performance criteria.
- J. Install perimeter sealant in accordance with Section 07900.
- K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

#### **3.03 TOLERANCES**

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 1/2 inch and minimum of 1/4 inch.

#### **3.04 MANUFACTURER'S FIELD SERVICES**

#### **BRYAN VILLAGE SHOPPETTE IMAGE UPGRADE**

**FT. STEWART, GEORGIA / PWBA 110803**

AAFES PROJECT NUMBER 0756-10-000007

METAL FRAMED CURTAIN WALL

08910 - 5

- A. See Section 01400 for general requirements for manufacturer observation of installation.
- B. Provide curtain wall manufacturer's field surveillance of the installation. Monitor and report installation procedures, unacceptable conditions.

### **3.05 CLEANING**

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

**END OF SECTION**

## SECTION 09260

### GYPSUM BOARD ASSEMBLIES

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Metal stud wall framing.
- B. Gypsum wallboard.
- C. Joint treatment and accessories.

##### 1.02 RELATED REQUIREMENTS

- a. Section 07900 - Joint Sealers: Acoustic sealant.

##### 1.03 REFERENCE STANDARDS

- A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- B. AISI SG-971 - Specification for the Design of Cold-Formed Steel Structural Members; 1996, with 2000 Supplement.
- C. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2006a.
- D. ASTM C 475/C 475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002.
- E. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members; 2007.
- F. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2006.
- G. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2004.
- H. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board; 2007.
- I. ASTM C 954 - 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; 2004.
- J. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2004.
- K. ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2005.
- L. ASTM C 1396/C 1396M - Standard Specification for Gypsum Board; 2006a.
- M. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2005.
- N. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2004.
- O. ASTM E 413 - Classification for Rating Sound Insulation; 2004.

P. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2007.

Q. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2006.

#### **1.04 SYSTEM DESCRIPTION**

A. Acoustic Attenuation for Interior Partitions Indicated as Acoustic: STC of 45-49 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

#### **1.05 SUBMITTALS**

A. See Section 01300 - Submittals, for submittal procedures.

B. Product Data: Provide data on metal framing, gypsum board, accessories, joint finishing system, glass mat faced gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Test Reports: For all stud framing products that do not comply with ASTM C 645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

#### **1.06 QUALITY ASSURANCE**

A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.

B. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 3 years of documented experience.

#### **1.07 REGULATORY REQUIREMENTS**

A. Conform to applicable code for fire rated assemblies as indicated on drawings.

### **PART 2 PRODUCTS**

#### **2.01 GYPSUM BOARD ASSEMBLIES**

A. Provide completed assemblies complying with ASTM C 840 and GA-216.

#### **2.02 METAL FRAMING MATERIALS**

A. Manufacturers - Metal Framing, Connectors, and Accessories:

1. Clark Western Building Systems: [www.clarkwestern.com](http://www.clarkwestern.com).
2. Dietrich Metal Framing: [www.dietrichindustries.com](http://www.dietrichindustries.com).
3. MarinoWare: [www.marinoware.com](http://www.marinoware.com).
4. The Steel Network, Inc: [www.SteelNetwork.com](http://www.SteelNetwork.com).
5. Telling Industries: [www.tellingindustries.com](http://www.tellingindustries.com).
6. Substitutions: See Section 01600 - Product Requirements.

B. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.

1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
  2. Studs: "C" shaped with flat or formed webs with knurled faces.
  3. Runners: U shaped, sized to match studs.
  4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
  5. Resilient Furring: 1/2-inch deep, 0.020-inch thick, asymmetrical, with face attached to single flange by a slotted leg; designed to reduce sound transmission.
  6. Drywall Grid Hanging and Framing Systems: Equivalent to Armstrong "Drywall Grid System," with HD8906 main beams (flange width: 1-1/2 inches; web height: 1-11/16 inches).
- C. Loadbearing Studs for Application of Gypsum Board.
- D. Ceiling Hangers: Type and size as specified in ASTM C 754 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 North American Specification for the Design of Cold-Formed Steel Structural Members.
  2. Material: ASTM A 653/A 653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
  3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems of fire rating and movement required.
  4. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
  5. Acceptable Products: VertiClip(r) or VertiTrack(tm) manufactured by The Steel Network Inc.

## **2.03 BOARD MATERIALS**

- A. Manufacturers - Gypsum-Based Board:
1. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  2. Georgia-Pacific Gypsum LLC: [www.gp.com/gypsum](http://www.gp.com/gypsum).
  3. National Gypsum Company: [www.nationalgypsum.com](http://www.nationalgypsum.com).
  4. USG Corporation: [www.usg.com](http://www.usg.com).
  5. Substitutions: See Section 01600 - Product Requirements.
- B. Gypsum Wallboard: ASTM C 1396/C 1396M, D 3273 Sizes to minimize joints in place; ends square cut.
1. Regular Type: fiberglass faced mold resistant
    - a. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
  2. Thickness: 5/8 inch.
  3. Edges: Tapered.

## **2.04 ACCESSORIES**

- A. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced.
- B. Acoustic Sealant: As specified in Section 07900.
- C. Finishing Accessories: ASTM C 1047, 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.
- D. Joint Materials: ASTM C 475 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, except as otherwise indicated.
  3. Ready-mixed vinyl-based joint compound.
  4. Chemical hardening type compound.
- E. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.
- F. Screws for Attachment to Steel Members From 0.033 to 0.112 Inch in Thickness: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.
- G. Screws: ASTM C 1002; self-piercing tapping type, cadmium-plated.
- H. Screws: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.
- I. 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 C 754 and manufacturer's instructions.
- B. Studs: Space studs at 16 inches on center.
1. Extend partition framing to structure as noted on drawings.
  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.
- C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- D. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.

#### **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 as follows:
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. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.

### **3.04 BOARD INSTALLATION**

- A. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board 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. 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. Installation on Metal Framing: Use screws for attachment of all gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
- F. 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 and ceilings 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 Fiber Faced Gypsum Board: Use fiberglass joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C 840, as follows:
  - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
  - 3. Level 5: Walls where graphics are to be applied or semi-gloss paint finish is scheduled.

- C. Finish gypsum board in scheduled areas in accordance with levels defined in ASTM C 840 and as scheduled below.
  - 1. Above Finished Ceilings Concealed From View: Level 1.
  - 2. Utility Areas and Areas Behind Cabinetry: Level 2.
  - 3. Walls and Ceilings to Receive Flat or Eggshell Paint Finish: Level 4.
- 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 base layer of double layer applications.

### **3.07 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

### **3.08 FINISH LEVEL SCHEDULE**

- A. Level 1: Above finished ceilings concealed from view.
- B. Level 2: Areas behind cabinetry.
- C. Level 4: Walls and ceilings scheduled to receive flat, eggshell, or satin paint finish.

**END OF SECTION**

## SECTION 09300

### TILE

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall base applications.
- C. Marble thresholds.

##### 1.02 RELATED SECTIONS

- A. Section 07900 - Joint Sealers.
- B. Section 09260 - Gypsum Board Assemblies: Installation of light gage metal framing.

##### 1.03 REFERENCES

- A. ANSI A108 Series/A118 Series/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2005.
  - 1. ANSI A118.3 - American National Standard Specifications for Installation of Chemical Resistant, water Cleanable Tile-Setting and Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive 2005
  - 2. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (R2005).
  - 3. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (R2005).
- B. TCA (HB) - Handbook for Ceramic Tile Installation; Tile Council of North America, Inc.; 2009

##### 1.04 SUBMITTALS

- A. See Section 01300 - 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. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- D. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

##### 1.05 QUALITY ASSURANCE

- A. Maintain one copy of TCA Handbook and ANSI A108 Series/A118 Series on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum 5 years of documented experience.
- C. Installer Qualifications: Company specializing in performing tile installation, with minimum of 5 years of documented experience.

##### 1.06 FIELD CONDITIONS

- A. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

## **PART 2 PRODUCTS**

### **2.01 TILE**

- A. Manufacturers: See finish schedule on drawings for floor tile, wall tile, and tile base selections.
- B. Tile as indicated on Drawings:
  - 1. Product/Manufacturer: As indicated on drawings.
  - 2. Size and Shape: As indicated on drawings.
  - 3. Edges: Square.
  - 4. Colors: As indicated on drawings
  - 5. Trim Units: Matching bullnose, cove, and trim shapes in sizes coordinated with field tile.

### **2.02 TRIM AND ACCESSORIES**

- A. Thresholds: White marble at toilet room door

### **2.03 MORTAR MATERIALS**

- A. Manufacturers:
  - 1. Bonsal American, Inc: [www.sakrete.com](http://www.sakrete.com)
  - 2. Bostik, Inc: [www.bostik-us.com](http://www.bostik-us.com).
  - 3. Custom Building Products: [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
  - 4. Substitutions: See Section 01600 - Product Requirements.
- B. Mortar Bond Coat Materials:
  - 1. Epoxy Cement type: ANSI A118.3.

### **2.04 GROUT MATERIALS**

- A. Manufacturers:
  - 1. Polyblend: Color as indicated on drawings.
  - 2. Bostik, Inc: [www.bostik-us.com](http://www.bostik-us.com).
  - 3. Custom Building Products: [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
  - 4. Substitutions: See Section 01600 - Product Requirements.
- B. Grout: Epoxy cement grout, sanded or unsanded, as specified in ANSI A118.7.
  - 1. Color: As indicated on drawings.

## **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 required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Protect surrounding work from damage.
- B. Remove all existing flooring materials and adhesives.
- C. Vacuum clean surfaces and damp clean.

- D. Seal substrate surface cracks with filler and apply anti-fracture membrane in accordance with TCA Handbook Method. Level existing substrate surfaces to acceptable flatness tolerances.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

### **3.03 INSTALLATION - GENERAL**

- A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and TCA Handbook recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor, base, and wall joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- E. Form internal angles coved and external angles bullnosed.
- F. Install thresholds where indicated.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- I. Allow tile to set for a minimum of 48 hours prior to grouting.
- J. Grout tile joints.
- K. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

### **3.04 INSTALLATION - FLOORS - THIN-SET METHODS**

- A. Over all interior concrete substrates, install tile in accordance with TCA Handbook Method, with epoxy cement mortar and epoxy cement grout.

### **3.05 CLEANING**

- A. Clean tile and grout surfaces.

### **3.06 PROTECTION**

- A. Do not permit traffic over finished floor surface for 4 days after installation.

**END OF SECTION**

## SECTION 09511

### SUSPENDED ACOUSTICAL CEILINGS

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

##### 1.02 RELATED SECTIONS

- A. Section 07900 - Joint Sealers: Acoustical sealant.

##### 1.03 REFERENCES

- A. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2004.
- B. ASTM C 636/C 636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2006.
- C. ASTM E 580/E 580M - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 2006.
- D. ASTM E 1264 - Standard Classification for Acoustical Ceiling Products; 1998 (Reapproved 2005).

##### 1.04 SUBMITTALS

- A. See Section 01300 - 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 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

##### 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 20 sq ft of each type of acoustical unit for AAFES use in maintenance of project.

## **PART 2 PRODUCTS**

### **2.01 ACOUSTICAL UNITS**

- A. Manufacturers:
  - 1. Armstrong World Industries, Inc: [www.armstrong.com](http://www.armstrong.com).
  - 2. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  - 3. USG: [www.usg.com](http://www.usg.com).
  - 4. Substitutions: See Section 01600 - Product Requirements.
- B. Acoustical Units - General: ASTM E 1264, Class A.
- C. Acoustical Panels (Type LT-1): As indicated on drawings
  - 1. Design Basis: Fissured 562" manufactured by USG: [www.usg.com](http://www.usg.com).
  - 2. Size: 2' x 4' x 5/8".
  - 3. Edge: Square.
  - 4. NRC: 0.55.
  - 5. Ceiling Attenuation Class (CAC): 35.
  - 6. Light Reflectance: 0.81.
  - 7. Color: White

### **2.02 SUSPENSION SYSTEM(S)**

- A. Manufacturers:
  - 1. Armstrong World Industries, Inc: [www.armstrong.com](http://www.armstrong.com).
  - 2. Chicago Metallic Corporation: [www.chicagometallic.com](http://www.chicagometallic.com).
  - 3. USG: [www.usg.com](http://www.usg.com).
  - 4. Substitutions: See Section 01600 - Product Requirements.
- B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- C. Exposed Steel 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.
  - 3. Finish: White painted.
  - 4. Design Basis: "Donn DX" manufactured by USG: [www.usg.com](http://www.usg.com).

### **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: Specified in Section 07900.
- 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 C 636, ASTM E 580, 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 ERECTION 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 09650

### RESILIENT FLOORING

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Resilient tile flooring.
- B. Resilient base.
- C. Installation accessories.

##### 1.02 RELATED SECTIONS

- A. Section 03390 - Concrete Curing: Restrictions on curing compounds for concrete slabs and floors.

##### 1.03 REFERENCES

- A. ASTM E 648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2006a.
- B. ASTM F 710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2005.
- C. ASTM F 1700 - Standard Specification for Solid Vinyl Floor Tile; 2004.
- D. ASTM F 1861 - Standard Specification for Resilient Wall Base; 2002.
- E. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; [www.baaqmd.gov](http://www.baaqmd.gov); current edition.
- F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association; 2006.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).

##### 1.04 SUBMITTALS

- A. See Section 01300 - 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 illustrating color and pattern for each resilient flooring product specified.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

##### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect roll materials from damage by storing on end.

##### 1.06 FIELD CONDITIONS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- B. 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 Tile: Printed film type, with solid wear layer, and:
  - 1. Minimum Requirements: Comply with ASTM F 1066 Class 2, corresponding to type specified.
  - 2. Critical Radiant Flux (CRF): Class I Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
  - 3. Sizes: 12 x 12 inch, as indicated on drawings.
  - 4. Wear Layer Thickness: 1/8"
  - 5. Total Thickness: 1/8".
  - 6. Patterns: Imperial Texture-Standard Excelon.
  - 7. Color: 51839 Fortress White
  - 7. Manufacturers:
    - a. Armstrong World Industries: [www.armstrong.com](http://www.armstrong.com)

### **2.02 RESILIENT BASE**

- A. Resilient Base (Type RB-1): ASTM F 1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
  - 1. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
  - 2. Height: 4 inch.
  - 3. Thickness: 1/8" inch thick.
  - 4. Finish: Satin.
  - 5. Length: Roll.
  - 6. Colors: P158 Sand.
  - 7. Accessories: Premolded external corners and internal corners.
  - 8. Manufacturers:
    - a. Roppe: [www.roppe.com](http://www.roppe.com)
    - b. Substitutions: See Section 01600 - Product Requirements.

### **2.03 ACCESSORIES**

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
  - 1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.
- C. Moldings and Edge Strips: Same material as flooring, or profiles and thicknesses required, in colors as selected by Contracting Officer.
- D. Filler for Coved Base: Plastic.
- E. Sealer and Wax: Types recommended by flooring manufacturer.

## **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 athletic 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. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation

by testing for moisture emission rate and alkalinity in accordance with ASTM F 710; 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. Prepare sub-floor surfaces as recommended by flooring and adhesive manufacturers.
- B. 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.
- C. Prohibit traffic until filler is cured.
- D. Clean substrate.
- E. 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 instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints 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. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
  - 2. 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 manufacturer's instructions say otherwise.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- C. Install tile to ashlar pattern. 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.
- 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.
- B. Clean in accordance with manufacturer's instructions.

### **3.07 PROTECTION**

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

**END OF SECTION**

## SECTION 09900

### PAINTS AND COATINGS

#### 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 surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- 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. Floors, unless specifically so indicated.
  - 6. Glass.
  - 7. Concealed pipes, ducts, and conduits.
- E. See Schedule - Surfaces to be Finished, at end of Section.

##### 1.02 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2007.
- C. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 1992 (Reapproved 2003).
- D. GreenSeal GS-11 - Paints; 1993.

##### 1.03 DEFINITIONS

- A. Conform to ASTM D 16 for interpretation of terms used in this section.

##### 1.04 SUBMITTALS

- A. See Section 01300 - 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.

### **1.05 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.

### **1.06 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. Paints, Primer Sealers, and Block Fillers:
  - 1. Base Manufacturer: ICI Paints North America: [www.icipaintsstores.com](http://www.icipaintsstores.com).
  - 2. Benjamin Moore & Co: [www.benjaminmoore.com](http://www.benjaminmoore.com).
  - 3. PPG Architectural Finishes, Inc: [www.ppgaf.com](http://www.ppgaf.com).
  - 4. The Sherwin-Williams Company; [www.sherwin-williams.com](http://www.sherwin-williams.com).
- C. Substitutions: See Section 01600 - Product Requirements.

### **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. Supply each coating material in quantity required to complete entire project's work from a single production run.
  - 3. 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:
  - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
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.

## **2.03 PAINT SYSTEMS - INTERIOR**

- A. Wood, Opaque, Latex, 3 Coat:
  1. One coat of latex primer sealer; Ultra-Hide Aquacrylic GRIPPER Stain Killer Primer-Sealer 3210-1200.
  2. Semi-gloss: Two coats of latex enamel; Dulux Ultra 1407.
- B. Ferrous Metals, Primed, Latex, 2 Coat:
  1. Touch-up with waterborne acrylic metal primer; Devflex 4020PF.
  2. Semi-gloss: Two coats of latex enamel; Dulux Ultra 1407.
- C. Gypsum Board/Glass Mat Faced Gypsum Board/Plaster, Latex-Acrylic, 3 Coat:
  1. One coat of latex primer sealer; Prep & Prime Hi-Hide Wall Primer Sealer 1000-1200.
  2. Eggshell: Two coats of latex-acrylic enamel; Dulux Ultra Eggshell 1403.

## **2.04 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. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. 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 D 4442.

### **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 mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
- 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. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- H. 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.
- I. 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.
- J. 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.
- K. 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.
- L. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces and all cutouts with clear sealer.
- M. Metal frames to be Painted: Prime and paint metal door top and bottom edge surfaces to match face of door.

### **3.03 APPLICATION**

- A. Apply products in accordance with manufacturer's instructions.
- B. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance.
- E. 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.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the

grain before set. Wipe excess from surface.

- I. 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 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

### **3.06 SCHEDULE - SURFACES TO BE FINISHED**

- A. Do Not Paint or Finish the Following Items:
  1. Items fully factory-finished unless specifically noted.
  2. Fire rating labels, equipment serial number and capacity labels.
  3. Stainless steel items.
  4. Insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports occurring in mechanical or electrical rooms or other utilitarian spaces.
- B. Paint the surfaces described in PART 2, Paint Systems Articles.
- C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
  1. Paint all equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
  2. Paint shop-primed items occurring in finished areas.
  3. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
  4. Paint dampers exposed behind louvers, grilles, and convactor and baseboard cabinets to match face panels.
- D. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

**END OF SECTION**

## SECTION 10425

### SIGNS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Engraved door signage at restroom.
- B. Exterior building signs for Subway

##### 1.02 QUALITY ASSURANCE

- A. Uniformity of Manufacturer: For each sign form and graphic image process indicated, furnish products of a single manufacturer.
- B. Design Criteria: The specifications and/or drawings indicate sizes and styles of signs and are based on the specific types and models indicated. Signs by other manufacturers may be considered provided that deviations in dimensions and profiles are minor and do not change the design concept as judged by the Contracting Officer. The burden of proof of equality is on the proposer.
  - 1. AAFES signage standards will be the design criteria, unless indicated otherwise.

##### 1.03 SUBMITTALS

- A. See Section 01300 - Submittals, for submittal procedures.
- B. Product Data: Submit manufacturer's technical data and installation instructions for each type of sign required.
- C. Samples: Submit samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacture and design of each sign component including graphics.
- D. Shop Drawings: Submit shop drawings for fabrication and erection of signs. Include plans, elevations, message list for each sign required, and large scale details of sign wording and lettering layout. Show anchorages and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.

#### PART 2 - PRODUCTS

##### 2.01 ENGRAVED DOOR SIGNAGE

- A. General: Door signage shall be equivalent to the following types as manufactured by Andco Industries Corp., Greensboro, NC. phone 1-800-476-8900. All engraving shall be incised 1/32" minimum. All signage shall also have Grade 2 Braille messages.
  - 1. Types H, & T: 1400 Series, manufactured from 1/16" thick plastic engraving stock with message engraved through first layer to expose contrasting color of the inner core of the engraving stock, and with raised Braille message.
    - a. Size: 8" x 8"
    - b. Colors: As selected from manufacturer's standards. Submit actual samples of signage units with samples of color selections. Match existing.
    - c. Mounting Method: Screw-mounted, 4 per sign.
    - d. Locations: At restroom door provide "HC" sign and symbol, along with sign to read "RESTROOM."

## **2.02 EXTERIOR, LIGHTED “SUBWAY’S” SIGNS**

A. Subway’s will furnish signs for installation by GC. Provide all required anchorage at existing walls. Provide power (j boxes) for all lighted signs. Contractor shall hook up lighted signs.

## **PART 3 - EXECUTION**

### **3.01 INSTALLATION**

- A. General: Locate sign units and accessories where shown or scheduled, or as directed by Contracting Officer or designated representative if not otherwise indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
  - 1. Install sign units level and plumb, with sign surfaces free from distortion or other defects in appearance.
  
- B. Wall-Mounted Panel Signs: Attach panel signs to wall surfaces using round-head screw fasteners appropriate for the various substrates on which they occur.
  - 1. Mounting Location and Height: Door signage shall be located alongside the door on the latch side and shall be mounted at a height of 60 inches above the finished floor to the bottom of the sign. Where two signs are indicated for one door, the second sign shall be mounted directly beneath and in contact with the first sign.

### **3.02 CLEANING AND PROTECTION**

- A. At completion of installation, clean soiled sign surfaces in accordance with manufacturer's instructions. Protect units from damage until acceptance by AAFES.

**END OF SECTION**

## SECTION 10522

### FIRE EXTINGUISHERS CABINETS AND ACCESSORIES

#### PART 1 - GENERAL

##### 1.01 RELATED DOCUMENTS

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

##### 1.02 DESCRIPTION OF WORK

- A. Definition: "Fire extinguishers" include units which can be hand-carried as opposed to those which are equipped with wheels or to fixed fire extinguishing systems, unless otherwise indicated. Types of products in this section include:

1. Fire extinguishers.
2. Mounting brackets for fire extinguishers.

##### 1.03 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain products in this section from one manufacturer.
- B. UL-Listed Products: Provide new portable fire extinguishers which are UL-listed and bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

##### 1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required. For fire extinguisher cabinets include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style and materials. Where color selections by Contracting Officer or designated representative are required, include color charts showing full range of manufacturer's standard colors and designs available.

#### PART 2 - PRODUCTS

##### 2.01 ACCEPTABLE MANUFACTURERS

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

J. L. Industries  
Larsen's Manufacturing Company  
Modern Metal Products, Division of Technico, Inc.  
Potter Roemer, Inc.

##### 2.02 FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors which comply with requirements of governing authorities.

1. Abbreviations indicated below to identify extinguisher types relate to UL classification and ratings system and not necessarily to type and amount of extinguishing material contained in extinguisher.

B. ABC and BC Type Extinguishers: UL-rated for class A, B, C fires and B,C fires. Provide 10-lb. nominal capacity, in enameled steel container.

### 2.03 FIRE EXTINGUISHER MOUNTING BRACKETS

A. Product/Manufacturer: Provide steel mounting brackets for attachment to masonry walls, finished in red enamel, of size and configuration to suit specified fire extinguishers. Brackets shall be equivalent to those manufactured by J.L. Industries.

1. Provide brackets for fire extinguishers not located in cabinets.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities. In general, mount cabinets with centers not over 40 inches above the finish floor.

1. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.
2. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
3. Install one fire extinguisher in each fire extinguisher cabinet.

END OF SECTION

## SECTION 10800

### TOILET ACCESSORIES

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

A. Work described in this section includes stainless steel toilet accessories and stainless steel framed mirrors.

1. Provide coordination necessary for the installation of the required concealed wood blocking at anchorage locations.

B. Related work specified elsewhere includes:

06100: Rough Carpentry (wood blocking)

##### 1.02 QUALITY ASSURANCE

A. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

B. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

C. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise acceptable to Contracting Officer.

D. Manufacturer: Subject to compliance with requirements, provide toilet accessories and mirror units by one of the following:

Accessory Specialties, Inc.  
American Dispenser Company, Inc.  
Bobrick Washroom Equipment, Inc.  
Bradley Corp.  
The Charles Parker Company  
Watrous, Inc.

E. Proprietary names and model numbers used to designate products in the Toilet Accessory Schedule are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.

##### 1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory.

B. Setting Drawings: Provide setting drawings, templates, instructions and directions for installation of anchorage devices in other work.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. Stainless Steel: AISI Type 302/304 with polished No. 4 finish, 22-gage minimum, unless otherwise indicated.
- B. Brass: Leaded and unleaded, flat products, FS QQ-B-613; rods, shapes, forgings and flat products with finished edges, FS QQ-B-626.
- C. Sheet Steel: Cold rolled, commercial quality ASTM A 366, 20 gage minimum unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheets: ASTM A 527, G60.
- E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B 456, TYPE SC-2.
- F. Baked Enamel Finish: Factory-applied, gloss white, baked acrylic enamel coating.
- G. Galvanized Steel Mounting Devices: ASTM A 386, hot-dip galvanized after fabrication.
- H. Mirror Glass: Federal Specification DD-G-451, Type 1, Class 1, quality q2, 1/4 inch thick, with silver coating, copper protective coating, and protective organic coating complying with FS DD-M-411.
- I. Fasteners: Screws, bolts and other devices of same material as accessory unit or of galvanized steel where concealed.

## 2.02 FABRICATION

- A. General: Stamped names or labels on exposed faces of toilet accessory units are not permitted, except where otherwise indicated; unobtrusive labels on surfaces not exposed to view are acceptable. Where locks are required for a particular type of toilet accessory, provide same keying throughout project. Furnish two keys for each lock.
- 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 piano hinge. Provide concealed anchorage wherever possible.
- C. Recessed Toilet Accessories, General: Except as 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 which is fully concealed when unit is closed.

## 2.03 TOILET ACCESSORY SCHEDULE

- A. Grab Bars (G.B.): 18 gauge type 304 stainless steel with concealed mounting, set screws for anchoring cover/mounting plate, 1-1/4 inch diameter, 1-1/2 inch clearance to wall, satin finish, and peened non-slip gripping surface. Provide grab bars in lengths that comply with all applicable requirements of ANSI 117.A. Provide Bobrick B-5507.99 Series or approved equal.
- B. Mirrors (M.G.): Stainless steel type 304, satin finished angle frame mirrors or mirror/shelf combination units (as indicated), glazed with manufacturer's standard 1/4 inch float/plate glass mirror, complete with galvanized steel back and concealed wall hanger mounting. Sizes and combination shelf (if any) as indicated on the drawings. Provide Bobrick B-290 Series or approved equal.
- C. Coat Hook (C.H.): Stainless steel with bright polished finish and theft-resistant concealed mounting. Mount centered on door width, at height and locations indicated on drawings. Provide Bobrick B-671 or approved equal.

- D. Paper Towel Dispenser (PTD): Recessed paper towel dispenser and waste receptacle shall be constructed entirely of type 304 stainless steel with satin finish. Paper towel dispenser door shall be drawn, 18-gauge (1.2mm), one-piece, seamless construction with 9/16" (14mm) 90° return edges; secured to cabinet with a concealed, full-length stainless steel piano-hinge; and be equipped with a cable door-swing limiter and two tumbler locks. Rounded towel tray shall have a hemmed opening to dispense paper towels without tearing. Paper towel dispenser shall dispense 600 C-fold or 800 multifold paper towels without any additional adapters. Waste receptacle shall be furnished with removable, leak-proof, rigid molded plastic waste container. Minimum capacity: 3.8-gal. (14.4-L)
- E. Toilet Tissue Dispenser (TTD): Bright polished stainless steel with theft resistant concealed mounting and spindles. Bobrick B-686.60.
- F. Soap Dispenser (SD): Stainless steel, type 304, satin finish, with 40 fluid ounce capacity, and concealed vandal-resistant mounting and refill operation. Provide Bobrick B-112 or approved equal.
- G. Baby Changing Station (BC): KOALA,

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install toilet accessory units in accordance with manufacturer's instructions, using fasteners which are appropriate to substrate and recommended by manufacturer of unit. Install units plumb and level, firmly anchored in locations and at heights indicated.

### 3.02 ADJUST AND CLEAN

- 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 after removing labels and protective coatings.

**END OF SECTION**

## SECTION 11400

### FOOD SERVICE EQUIPMENT AF/CI

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

- A. Work described in this section includes food service equipment as indicated on the drawings and by provisions of this section, including schedules and equipment list associated with either drawings or this section or both. The types of equipment required for project include the following:
1. Providing and installing certain items of equipment in the Snack Avenue food operation area of the project.
  2. Installation of certain items of equipment furnished by AAFES or vendors to AAFES at the Snack Avenue food operation and seating areas of the project.
- B. Refer to Division-15 sections for required drain traps, steam traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete mechanical hookup of food service equipment.
- C. Refer to Division-16 sections for wiring disconnects, and other materials necessary to complete electrical hookup of food service equipment.
- D. The Contractor and his various Subcontractors, Suppliers, Fabricators and Installers, shall thoroughly review the Contract Drawings and Specifications so as to verify that all work required by other trades for and related to Food Service equipment is provided either under this section or elsewhere as part of this contract.
1. All components required for complete and fully operating Food Service Equipment may not be specifically indicated, but they shall be considered to be included by the Food Service Equipment Contractor in his work and at no additional cost to the Contract Sum.
    - a. The Contracting Officer shall be notified of any such discrepancies prior to bidding.
- E. Related Documents
1. Drawings and general provisions of contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.
- F. The Contractor shall verify and identify all equipment by other trades and which is related to Food Service Equipment as indicated herein and on the Drawings, and shall provide all necessary coordination for its being placed in service at locations indicated and/or required for the intended and proper operation of food service and related equipment.

##### 1.02 QUALITY ASSURANCE (for items furnished by AAFES or Vendors to AAFES and installed by the Contractor and for items furnished and installed by the Contractor as appropriate.

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of food service equipment of types, capacities, and sizes required and whose products have been in satisfactory use in similar service for not less than 5 years.
- B. Installer's Qualifications: Contractor shall engage a firm with at least 3 years of successful installation experience on projects with food service equipment similar to that required for project.
- C. Fabricator's Qualifications: Where indicated units require custom fabrication, provide units fabricated by shop which is skilled in the type work required and with a minimum of 5 years of

experience in similar work. Fabricate all custom equipment items at same shop. Where units cannot be fully shop-fabricated, complete fabrication work at project site.

#### D. Codes and Standards

1. NSF Standards: Comply with applicable National Sanitation Foundation (NSF) standards and recommended criteria. Provide each principal item of food service equipment with a NSF "Seal of Approval".
2. UL Labels: Where available, provide UL labels on prime electrical components of food service equipment. Provide UL "recognized marking" on other items with electrical components, signifying listing by UL, where available.
3. ANSI Standards: Comply with applicable ANSI standards for electric powered appliances and for plumbing fittings, including vacuum breakers and air gaps to prevent siphonage in water piping.
4. NFPA Codes: Install food service equipment in accordance with the following National Fire Protection Codes (NFPA) Codes:  
  
National Electric Code 2008  
NFPA 70 - National Electric Code  
NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
5. Health Code: Install food service equipment in accordance with local health department applicable regulations and regulations of the Installation.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for each item to be furnished by the Contractor; include roughing-in dimensions, service connection requirements, performances, materials, manufacturer's model numbers, furnished accessories, power/fuel requirements, water/drainage requirements, and other similar information. AAFES or its vendors shall furnish to the Contractor this type data regarding items they are furnishing for installation by the Contractor.
- B. Shop Drawings: Submit dimensioned roughing-in drawings for all equipment furnished by AAFES or by the Contractor, at minimum scale 1/2" = 1'-0", showing mechanical and electrical requirements. Submit dimensioned fabrication drawings for custom fabricated equipment including plans, elevations, and sections, at minimum scale of 3/4" = 1'-0", showing materials and gages used.
- C. Maintenance Data: Submit maintenance data and parts lists for each item of food service equipment furnished by the Contractor. Include this data, product data, shop drawings, and wiring diagrams in maintenance manual.
- D. Provide a minimum of eight (8) sets of submittal data.
  1. See Section 01700: PROJECT CLOSEOUT for additional requirements.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall take delivery of AAFES furnished or AAFES Vendor furnished food service equipment in factory-fabricated containers designed to protect equipment and finish until final installation. The same shall apply to food service equipment furnished by the Contractor. Contractor shall make arrangements to receive equipment at project site, or to hold in a bonded and insured warehouse approved by Contracting Officer, until delivery can be made to job site.
- B. Store food service equipment in original containers, and in locations to provide adequate protection to equipment while not interfering with other construction operations.

- C. Handle food service equipment carefully to avoid damage to components, enclosures, and finish. Do not install damaged food service equipment; replace and return damaged components to equipment manufacturer. Report and document any damaged equipment to the Contracting Officer.

#### 1.05 PROJECT CONDITIONS

- A. Take field measurements to assure accurate fit of fabricated equipment.
- B. Check electrical characteristics and water and steam pressure. Provide pressure regulating valves where required for proper operation of equipment.

### PART 2 - PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS (FOR CONTRACTOR FURNISHED AND INSTALLED FOOD SERVICE EQUIPMENT).

- A. Approved Equals: Items specified by manufacturer's name and catalog number are intended to establish a standard of quality and required features. If Contractor elects to propose a substitute, written request accompanied by necessary data needed to evaluate the item must be made to Contracting Officer or designated representative at time required submittal is made. All items of a given "family" must be by same manufacturer insofar as possible. (Examples: All reach-in refrigerators and freezers, all fabrication, cooking battery, etc.).
  - 1. Approval of any proposed substitution is subject to acceptance by the Contracting Officer or designated representative.
  - 2. Where an item proposed for substitution may require additional or larger plumbing, mechanical or electrical connections and/or service than the items specified, the total cost of same shall be included in bid; no additional cost will be added to the work for this type expense.

#### 2.02 MATERIALS (FOR CONTRACTOR FURNISHED AND INSTALLED FOOD SERVICE EQUIPMENT AND FOR INSTALLATION OF AAFES FURNISHED EQUIPMENT).

- A. Stainless Steel: AISI Type 304. Provide non-magnetic sheets, free of buckles, waves, and surface imperfections. Provide No. 4 polished finish for any surfaces which will be exposed.
- B. Galvanized Sheet Steel: ASTM A 526, except ASTM A 527 for extensive forming; ASTM A 525, G90 zinc coating, chemical treatment.
- C. Sheet Steel: ASTM A 569 hot-rolled carbon steel.
- D. Stainless Steel Tube: ASTM A 554, Type 304 with No. 4 polished finish.
- E. Aluminum: ASTM B 209 sheet and plate, ASTM B 221 extrusions, 0.40-mil clear anodized finish where exposed, unless otherwise indicated.
- F. Sound Deadening: Heavy-bodied resinous coating filled with granulated cork or other resilient material, compounded for permanent, hard-drying, non-flaking adhesion to metal, in 1/8" thick coating which will dry to a smooth finished surface and without leaving dirt-catching crevices.
  - 1. Spray apply sound deadening material to underside of metal countertops, table tops, drainboards, dishtables, and sinks, after reinforcing members have been applied, completed, and surface has been properly cleaned and otherwise prepared. When dry and properly cured, clean and spray apply with opaque silver tone paint coating.
  - 2. Sound deadening material and paint shall be approved for use in a food service facility, fully compatible, and applied in strict compliance with manufacturers' recommendations.

- G. Sealants: ASTM C 920; Type S Grade NS, Class 25, Use NT. Provide sealant that when fully cured and washed meets requirements of Food and Drug Administration Regulation 21 CFR 177.2600 for use in areas where it comes in contact with food.
1. Color: As selected from manufacturer's full line of clear and solid colors, following Contractor's submittal of same.
- H. Gaskets: Solid or hollow (not cellular) neoprene or PVC; light gray, minimum 40 Shore A hardness, self-adhesive or prepared for either adhesive application or mechanical anchorage.

## 2.03 FABRICATED ITEMS – CF/CI

A. Fabrication of Casework: Casework items listed as custom-fab on food service equipment schedule shall comply with the requirements of Section 12304-"CASEWORK" of the project specifications.

B. Plumbing Fittings, Trim and Accessories:

- a. General: Where exposed or semi-exposed, provide bright chrome-plated brass or polished stainless steel units. Provide copper or brass where not exposed.
- b. Water Outlets: At sinks and at other locations where water is supplied (by manual, automatic or remote control), provide commercial quality faucets, valves, dispensers or fill devices, of type and size indicated and as required to operate as indicated. Include manual cut-off valves and connecting stem pipes to permit outlet servicing without shut-down of water supply piping system.
- c. Vacuum Breakers: Provide with food service equipment where required by governing regulations, including locations where water outlets are equipped for hose attachment, where required for proper operation, and where otherwise called for.
- d. P-Traps: Include removable P-traps where drains are indicated for direct connection to drainage system.
- e. Provide fittings, trim, and accessories necessary for hook-up to rough-ins (by others - see Plumbing) which are not required to be furnished by other trades.

C. Electrical Materials:

- a. General: Provide standard materials, devices and components as recommended by manufacturer/fabricator, selected and installed in accordance with NEMA standards and recommendations; and as required for safe and efficient use and operation of food service equipment, without objectionable noise, vibration and sanitation problems.
- b. Connections: Equip each item requiring electrical power with either a terminal box for permanent connection or cord-and-plug for interruptable connection, as indicated. Provide standard light gray grounded-type plug-and-cord units, matching outlets specified in DIVISION 16.
- c. Power Characteristics: Refer to Drawings and DIVISION 16 specifications for project power characteristics. Also, refer to individual equipment requirements for loads and ratings. Electrical characteristics must be coordinated with electrical Subcontractor and any deviation from scheduled parameters will necessitate circuit modifications. Coordinate power requirements with equipment as furnished.
- d. Nameplates: Where possible, locate nameplates and labels on manufactured items in accessible positions, but not within customer's normal view. Do not apply nameplates or labels on custom-fabricated work, except as required for compliance with governing regulations, insurance requirements, or operator performance.

- e. Provide all materials necessary for hook-up to rough-ins (by others - see Electrical) which are not required to be furnished by other trades.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Rough-In Work: Installer shall examine roughed-in mechanical and electrical services, and installation of floors, walls, columns, and ceilings, and other conditions under which food service work is to be installed; verify dimensions of services and substrates before fabricating work. Notify Contractor of unsatisfactory locations and dimensions of other work, and of unsatisfactory conditions for proper installation of food service equipment. Do not proceed with fabrication and installation until unsatisfactory dimensions and conditions have been corrected in manner satisfactory to Installer.

### 3.02 INSTALLATION

- A. General: Set each item of non-mobile and nonportable equipment securely in place, level and adjust to correct height. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorages where possible. Adjust counter tops and other work surfaces to level tolerance of 1/16" maximum offset, and maximum variation from level or indicated slope of 1/16" per foot.
- B. Field Joints: Complete field-assembly joints in work (joints which cannot be completed in shop) by welding, bolting-and-gasketing, or similar methods as indicated. Grind welds smooth and restore finish. Set or trim gaskets flush, except for "T" gaskets as indicated.
- C. Enclosed Spaces: Treat spaces that are inaccessible after equipment installation, by covering horizontal surfaces with powdered borax at rate of 4-oz. per sq. ft.
- D. Closure Plates and Strips: Install where required, with joints coordinated with units of equipment.
- E. Cut-Outs: Provide cut-outs in food service equipment where required to run plumbing, electric, gas, or steam lines through equipment items for final connections.
- F. Sealants and Gaskets: Install all around each unit to make joints air-tight, watertight, vermin-proof, and sanitary for cleaning purposes. In general, make sealed joints not less than 1/8" wide, and stuff backer rod to shape sealant bead properly, at 1/4" depth. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint. At internal-corner joints, apply sealant or gaskets to form a sanitary cove, of not less than 3/8" radius. Provide sealant-filled or gasketed joints up to 1/2" joint width; metal closure strips for wider joints, with sealant application each side of strips. Anchor gaskets mechanically or with adhesives to prevent displacement.
- G. Piping: Install necessary piping from relief valves on kettles, steamers, and similar equipment to exhaust in a manner to avoid steam coming in contact with operating personnel, and in accordance with applicable codes. Install required piping from indirect drain connections to floor drains.

### 3.03 FIELD QUALITY CONTROL

- A. Testing: Do not start-up food service equipment until service lines have been tested, balanced, and adjusted for pressure, voltage, and similar considerations; and until water and steam lines have been cleaned and treated for sanitation. Sanitize all potable water lines as required by the Installation. Before testing, lubricate each equipment item in accordance with manufacturer's recommendations.
  - 1. Test each item of operational equipment to demonstrate that it is operating properly, and that controls and safety devices are functioning. Repair or replace equipment which is found to be defective in its operation, including units which are below capacity or operating with excessive

noise or vibration. Report this type malfunction of all AAFES furnished equipment to the Contracting Officer.

### 3.04 CLEANING

- A. After completion of installation, and completion of other major work in food service areas, remove protective coverings, if any, and clean all food service equipment, internally and externally. Restore exposed and semi-exposed finishes to remove abrasions and other damages; polish exposed metal surfaces and touch-up painted surfaces. Replace work which cannot be successfully restored.
- B. Final Cleaning: After testing and start-up, and before time of substantial completion, clean and sanitize food service equipment, and leave in condition ready for use in food service.

### 3.05 CLOSEOUT PROCEDURES

- A. After completing Field Quality Control 3.03 and Cleaning 3.04 Contracting Officer or designated representative's acceptance, provide services of installer's technical representatives, and manufacturer's technical representatives where required, to instruct AAFES personnel in operation and maintenance of all food service equipment.
  - 1. Schedule Training with AAFES: Provide seven (7) days minimum prior written notice of training time and date to Contracting Officer. Contracting Officer or designated representative will coordinate this with the AAFES general manager for the installation.
  - 2. Provide written notice to Contracting Officer or designated representative upon completion of training; include name, title, and organization of all persons present, and of persons(s) trained.

## PART 4 - FOOD SERVICE EQUIPMENT SCHEDULE

### 4.01 EQUIPMENT

- A. Refer to drawings for Equipment Schedule.

**END OF SECTION**

## SECTION 15010

### BASIC MECHANICAL REQUIREMENTS

#### PART 1 - GENERAL

##### 1.1 SECTION INCLUDES

- A. Description of Basic Mechanical Requirements. Applies to all Division 15 sections.

##### 1.2 RELATED SECTIONS

- A. Requirements of Division 1, General Provisions.

##### 1.3 DEFINITIONS

- A. "Provide" means to furnish and install, complete and ready for operation.

##### 1.4 REFERENCES

- A. ANSI: American National Standards Institute, Inc.
- B. AMCA: Air Movement & Control Association.
- C. ARI: American Refrigeration Institute.
- D. ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers.
- E. ASME: American Society for Mechanical Engineers.
- F. ASSE: American Society of Sanitary Engineers.
- G. ASTM: American Society of Testing and Materials.
- H. AWWA: American Water Works Association.
- I. CISPI: Cast Iron Soil Pipe Institute.
- J. FM: Factory Mutual.
- K. NAIMA: North American Insulation Manufacturers Association.
- L. NEMA: National Electrical Manufacturer's Association.
- M. NFPA: National Fire Protection Association.
- N. NSF: National Sanitation Foundation.
- O. MSS: Manufacturer's Standardization Society of the Valve and Fitting Industry.
- P. PDI: Plumbing and Drainage Institute.
- Q. SMACNA: Sheet Metal and Air Conditioning Contractor's National Association.

R. UL: Underwriters Laboratories, Inc.

## 1.5 REGULATORY REQUIREMENTS

- A. Comply with current edition, unless otherwise noted, of the following codes and standards.
1. ANSI B31.9 - Building Services Piping.
  2. ADA - American's with Disabilities Act.
  3. ASHRAE 62 - Ventilation for Acceptable Indoor Air Quality.
  4. NFPA 13 - Installation of Sprinkler Systems
  5. NFPA 70 - National Electrical Code
  6. NFPA 90A - Installation of Air Conditioning and Ventilating Systems
  7. NFPA 91 - Exhaust Systems for Air Conveying of Materials
  8. IBC - International Building Code, with Mechanical and Plumbing .
- B. Permits, Licenses, Inspections and Fees.
1. Obtain and pay for all permits, licenses, inspections and fees, and comply with all rules, laws and ordinances pertaining to the Contractor's portion of the Work.
  2. Obtain and pay for certificates of required inspections, and file certificates with AAFES.
  3. All usage fees or charges based on utility flow rates, or assessments based on utility system amortization shall be paid by the AAFES.

## 1.6 PRODUCT REQUIREMENTS

- A. Provide new standard, first-grade materials throughout.
- B. Multiple items of similar equipment shall be the product of the same manufacturer.
- C. Substitutions:
1. Comply with the provisions of Division 1, Section "Product Requirements" and the following.
  2. When several manufacturers are named in the specifications, the corresponding products and models made by the specified manufacturers will be accepted and Contractor may base his bid on any one of those products. However, if the Contractor's bid is based on products other than the scheduled or specified **basis of design**, it shall be understood that there will be no extra cost involved whatsoever, and the effect on other trades has been included in the Contractor's proposal. Coordination with other trades for substituted equipment or use of products other than the named basis of design shall be the responsibility of the Contractor furnishing the equipment.
  3. The basis of design manufacturer's equipment has been used to determine space requirements. Should another approved manufacturer's equipment be used in preparing proposals, Contractor shall be responsible for determining that said equipment will fit space allocated. Submission of shop drawings or product data on such equipment shall be considered as indicating that the Contractor has reviewed the space requirements and the submitted equipment will fit the space allocated with due consideration given to access required for maintenance and code purposes.
  4. Each bidder may submit to the Contracting Officer a list of any substitutes which he proposes to use in lieu of the equipment or material named in the specifications with a request for the approval of proposed substitutes. To be considered, such requests must be delivered to the office of the Contracting Officer not later than 10 days prior to bid due date. The submittal shall include the following:

- a. Specific equipment or material proposed for substitution giving manufacturer, catalog and model number.
  - b. All performance and dimensional data necessary for comparison of the proposed substitute with the equipment or material specified.
  - c. A statement setting forth any changes in other materials, equipment or other Work that incorporation of the substitute may require.
- 5. The burden of proof of the merit of the proposed substitute is upon the proposer. The Contracting Officer's decision of approval or disapproval of a proposed substitution is final.
  - 6. All bidders will be advised by amendment of proposed substitutes which are found to be acceptable. Do not rely upon approvals made in any other manner.

## 1.7 SUBMITTAL

- A. Submit under provisions of Division 1, Section "Submittal Procedures" and the following:
- B. Product Data: Submit to the Contracting Officer and obtain his approval of a complete list of materials and equipment which are to be furnished under Division 15.
  - 1. List shall be complete with manufacturer's names, catalog number, dimensions, specifications, rating data and options utilized. Capacities shall be in the terms specified.
  - 2. Call attention to deviations from specified items as to operation and physical dimensions.
  - 3. Performance curves for equipment such as fans and pumps shall be included.
  - 4. Final equipment orders shall not be placed until submittals have been returned marked "No Exceptions Noted" or "Make Corrections Noted".
  - 5. Bind all equipment submittals and provide index tab for each type of equipment. Submit all at one time. Reserve two sets for project close-out documents.
  - 6. Submit complete automatic temperature control system control and power wiring diagrams for approval before installing controls. See Division 15 Section - "HVAC Instrumentation and Controls".
  - 7.

## 1.8 QUALITY ASSURANCE

- A. Installer's Qualifications: Firm experienced in installation of systems similar in complexity to those required for this project, plus the following:
  - 1. Acceptable to or licensed by manufacturer.
  - 2. Not less than 3 years experience with systems.
  - 3. Successfully completed not less than 5 comparable scale projects using this system.
  - 4. Plumbing Subcontractor: In addition to above, must have a current Master Plumber's Certificate and Master's Gas Certificate issued by the locality in which work occurs.
  - 5. Fire Protection Subcontractor: In addition to the above, the Fire Protection Contractor shall utilize the services of a licensed professional engineer in the State in which the work occurs or NICET Level 3 and be certified and licensed by the State Fire Marshal in the State in which the work occurs.

## 1.9 SUMMARY OF WORK

- A. Scope: Provide all labor, materials, equipment and services necessary for the completion

of all mechanical work shown or specified, except work specified to be done or furnished by others, complete and ready for operation.

- B. Equipment Furnished by Others.
  - 1. Connect or install equipment shown on mechanical drawings that requires plumbing and/or mechanical connections.
  - 2. Provide piping, shut-off valves and unions required for a complete installation.
  - 3. Equipment furnished by others includes:
    - a. Casework
    - b. Ice machines

#### 1.10 DRAWING INTERPRETATION AND COORDINATION

- A. Plans are intended to show size, capacity, approximate location, direction and general relationship of one phase to another, but not exact detail or arrangement.
- B. Do not scale drawings for location of system components. Check all measurements, location of pipe, ducts, and equipment with the detail architectural, structural, and electrical drawings and conditions existing in the field and lay out work so as to fit in with ceiling grids, lighting and other parts.
- C. Make minor adjustments in the field as required to provide the optimum result to facilitate ease of service, efficient operation and best appearance.
- D. Where doubt arises as to the meaning of the plans and specifications, obtain the Contracting Officer's written decision before proceeding with parts affected; otherwise assume liability for damage to other work and for making necessary corrections to work in question.
- E. Refer to Architectural Drawings for all dimensions, and locations of ceiling diffusers and sprinkler heads.

#### 1.11 PROJECT/SITE CONDITIONS

- A. Visiting Site: Visit site and become familiar with location and various conditions affecting work. No additional allowance will be granted because of lack of knowledge of such conditions. The contractor shall verify locations and elevations of existing ductwork, sprinkler piping, plumbing connections, and gas piping.
- B. Determine sizes and verify locations of existing utilities near site.
- C. Cause as little interference or interruption of existing utilities and services as possible. Schedule work which will cause interference or interruption in advance with AAFES, authorities having jurisdiction, and all affected trades.

#### 1.12 SUBMITTALS FOR PROJECT CLOSEOUT

- A. Submit under provisions of Division 1 Section - "Closeout Procedures", Section "Project Record Documents" and the following.

- B. Record Drawings:
1. Keep accurate record of corrections, variations, and deviations, including those required by change orders to the Air Conditioning, Plumbing and Fire Protection drawings.
  2. Accurately show location, size and elevation of new exterior work dimensioned from permanent structure.
  3. Record changes daily on a set of bluelines kept at the job site.
  4. Submit bluelines marked as noted above to Architect for review prior to request for final payment.
  5. Marked bluelines will be returned to Contractor for use in preparing record drawings.
  6. Drawings: Provide one complete set of drawings in PDF and AUTO-CAD format indicating the actual completed installation of the Work.
- C. Prior to the issuance of a certificate for final payment, submit to Contracting Officer and obtain his approval of the following:
1. Record drawings - sheet metal work (Prints).
  2. Record drawings - control systems (Prints).
  3. Control manufacturer's letter of certification (2).
  4. Air balance report (2). (See Division 15, Section - "Testing, Adjusting and Balancing".)
  5. Equipment Submittal Data (2).
  6. Equipment operating and maintenance manuals (2).
  7. Equipment warranty dates and guarantees (2).
  8. List of AAFES and Government Personnel who have received operating and maintenance instructions.
  9. Test results and certifications of fire protection systems and names of those witnessing test. (See Division 15, Section "Fire Protection System".)

#### 1.13 TEMPORARY USE OF MECHANICAL EQUIPMENT

- A. Use of existing mechanical and plumbing equipment to provide heat, air conditioning, ventilation and plumbing during construction will be permitted subject to compliance with the following provisions:
1. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.
  2. Automatic temperature control system shall function properly and all safety controls shall function to prevent equipment damage.
  3. The air filtering system utilized shall be that which is designed for the system when complete, and all filter elements shall be replaced at completion of construction and prior to testing and balancing of system.
  4. Air filters shall be changed periodically when dirty.
  5. All return air and outside air openings shall have temporary filter media installed over inlet side of opening and secured air tight there to.
- B. Prior to final inspection, the equipment or parts used which show wear and tear beyond normal, shall be replaced with identical replacements, at no additional cost to AAFES.
- C. Warranty dates shall start at Date of Substantial Completion. Provide extended warranty from manufacturer to cover time period between start-up and substantial completion.
- D. This paragraph shall not reduce the requirements of the mechanical specifications.

END OF SECTION

## SECTION 15050

### BASIC MECHANICAL MATERIALS AND METHODS

#### PART 1 - GENERAL

##### 1.1 SECTION INCLUDES

- A. Description of Basic Material and Methods. Applies to all Division 15 Sections.

#### PART 2 - PRODUCTS – Not Used.

#### PART 3 - EXECUTION

##### 3.1 WORKMANSHIP

- A. First class and in accordance with best practice.
- B. Poor or improper workmanship shall be removed and replaced as directed by the Contracting Officer.

##### 3.2 INSTALLATION OF EQUIPMENT

- A. Install equipment to facilitate servicing, maintenance and repair or replacement components. Connect equipment for ease of disconnecting, with minimum interference with other installations.
- B. Install equipment in accordance with manufacturer's instructions. If manufacturer's instructions conflict with Contract Documents, obtain Contracting Officer's decision before proceeding.
- C. All equipment shall be firmly fastened in place:
  - 1. Roof curb mounted equipment shall be secured to curbs to resist 140 mph winds.
  - 2. Pad mounted equipment shall be secured to pads using poured in place anchor bolts or cinch anchors. Additionally, pad mounted equipment shall be secured to concrete base structure with eye bolts, wire tie down straps, and adjustable turn buckles.
  - 3. Air devices connected by flexible duct shall be secured to prevent falling if grid shifts.

##### 3.3 CUTTING AND PATCHING

- A. Comply with the requirements of other Divisions for the cutting and patching required to accommodate the installation of Mechanical work. Repair and finish work to match surrounding existing finishes.
- B. The Contracting Officer approval shall be required before cutting any part where strength, or appearance of finished work is involved.

- C. Openings are to be laid out and built-in, set sleeves and inserts and furnish detailed layout drawings to other trades in advance of their work.

### 3.4 CONNECTION TO EXISTING SYSTEMS

- A. Make connections to existing systems only at time authorized, in writing, by Contracting Officer.
- B. Take existing systems and/or equipment out of service only at times authorized by Contracting Officer.
- C. Drain existing systems and fill, vent, test, balance and put existing systems into operation after connections have been made.
- D. Repair existing insulation at points of connection to existing work.

### 3.5 REMOVAL OF EXISTING WORK

- A. Work for General Contractor is confined to certain areas, but mechanical demolition work may have to extend to other areas.
- B. Dismantle the following items and store on site as directed by Contracting Officer. Any items that the Contracting Officer decides not to keep shall become the contractor's property and Contractor shall remove same from site and properly dispose of:
  - 1. HVAC
    - a. In area of renovation, remove all existing pipe, valves, hangers, duct, air devices to be removed to allow for new construction, or abandoned as a result of new construction or currently not in service as shown on drawings. Cap abandoned pipe and duct at mains.
    - b. Existing ductwork and equipment not being removed or reworked under this contract, but located so as to be affected by the work under this contract, shall remain in service. Such duct and equipment shall be extended, relocated or removed and reinstalled as required to accommodate new construction.
    - c. Unless noted otherwise, where equipment is indicated to be removed, the equipment shall remain the property of the Contracting Officer and Contractor shall load on AAFES provided truck at site. Should AAFES decide not to retain the equipment, equipment shall become property of the Contractor and shall be removed from the site.
  - 2. Plumbing
    - a. Where fixtures or equipment are indicated to be removed, remove the fixture, roughing and all piping back to mains and cap. Remove all abandoned piping from site.
    - b. Where fixtures or equipment are indicated to be removed, the fixture or equipment is to remain the property of AAFES and the Contractor shall deliver the fixtures and equipment to AAFESs storage facility as directed by AAFES. Should AAFES decide not to retail the fixtures or equipment, the fixtures and equipment shall become the property of the Contractor and shall be removed from the site.

### 3.6 PROTECTION AND CLEANING OF EQUIPMENT

- A. Equipment and materials shall be carefully handled, properly stores, and protected to prevent damage during construction. Repair or replace damaged work and materials.

**BRYAN VILLAGE SHOPPETTE IMAGE UPGRADE** BASIC MECHANICAL MATERIALS AND METHODS

**FT. STEWART, GEORGIA** / PWBA 110803

15050 - 2

AAFES PROJECT NUMBER 0756-10-000007

- B. At completion of all work, thoroughly clean fixtures, exposed materials and equipment and make ready for painting.

### 3.7 PAINTING

- A. Refinish equipment damaged during construction to new condition.

END OF SECTION 15050

## SECTION 15081

### MECHANICAL SYSTEMS INSULATION

#### PART 1 - GENERAL

##### 1.1 SECTION INCLUDES

- A. Piping insulation.
- B. Jackets and Accessories.
- C. Ductwork Insulation

##### 1.2 SUBMITTALS FOR REVIEW

- A. Section 15010: Procedures for submittals.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

##### 1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing insulation work with minimum 3 years experience.

##### 1.4 REGULATORY REQUIREMENTS

- A. Conform to maximum flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255 or UL 723.
- B. All insulation materials, adhesives, mastic and coating shall be asbestos free.

#### PART 2 - PRODUCTS

##### 2.1 MANUFACTURERS

- A. Acceptable Manufactures for Fiberglass Insulation Materials:
  - 1. Owens-Corning.
  - 2. Certaniteed.
  - 3. Knauf.
  - 4. Manville Corporation
- B. Acceptable Manufacturers for Adhesives, Mastics and Coatings:
  - 1. Armstrong.
  - 2. Benjamin Foster.
  - 3. Childers.
  - 4. Marathon.

- C. Acceptable Manufacturers for Metal Jackets:
  1. Childers.
  2. Manville Metal-Loc.
  
- D. Acceptable Manufactures for Grease Duct Fireproofing Insulation/Board:
  1. Thermal Ceramics "Firemaster."
  2. Premier "FP Duct Wrap."
  3. PABCO "Super Fire Temp."
  4. Certainteed "FlameChek."
  
- E. Acceptable Manufacturers for Foamed Plastic Closed Cell Elastometric Insulation Materials:
  1. Armstrong AP.
  2. Rubatex.

## 2.2 GLASS FIBER PIPE INSULATION

- A. Manufacturer: Owens-Corning Model SSL-11.
  
- B. Insulation: ASTM C547; rigid molded, noncombustible.
  1. 'K' value: ASTM C177, 0.24 at 75 degrees F.
  2. Maximum service temperature: 850 degrees F.
  3. Maximum moisture absorption: 0.2 percent by volume.
  
- C. Vapor Barrier Jacket:
  1. White kraft paper with glass fiber yarn, bonded to aluminized film.
  2. Moisture vapor transmission: ASTM E96; 0.02 perm-inches.
  
- D. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
  
- E. Vapor Barrier Lap Adhesive:
  1. Compatible with insulation.
  
- F. Insulating Cement/Mastic:
  1. ASTM C195; hydraulic setting on mineral wool.

## 2.3 GLASS FIBER, FLEXIBLE EXTERNAL DUCT WRAP

- A. Manufacturer: Certainteed Model "Standard Duct Wrap."
  
- B. Insulation: ASTM C553; flexible, noncombustible blanket.
  1. 'K' value: ASTM C518, 0.26 at 75 degrees F.
  2. Maximum service temperature: ASTM C411; 250 degrees F.
  3. Maximum moisture absorption: ASTM C1104; 5 percent by weight.
  4. Density: 1.0 lb/cu.ft.
  
- C. Vapor Barrier Jacket:
  1. FSK: Glass-scrim reinforced laminate of aluminum foil and kraft paper bound together.
  2. Moisture vapor transmission: ASTM E96; 0.02 perm.
  
- D. Vapor Barrier Mastic: Vinyl emulsion type acrylic or mastic, compatible with insulation, white color.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that piping, equipment and ductwork have been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

### 3.2 INSTALLATION

- A. Install in accordance with NAIMA National Insulation Standards.
- B. Exposed Piping: Locate insulation and cover seams in least visible locations.
- C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
- D. Fit pipe hangers over insulation.
- E. Inserts and Shields:
  - 1. Application: Protect insulated piping at hangers with shields.
  - 2. Shields: 10 inch long, 22 gage galvanized steel formed in half circle to fit insulation.
- F. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish fire stopping at supports, protrusions, and interruptions. At fire separations, refer to Division 7 and Section 15060: Sleeves.

### 3.3 GLASS FIBER PIPE INSULATION APPLICATION

- A. Provide vapor barrier jackets, factory or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding stapes 4 inch on center and vapor barrier mastic.
- B. Insulate fittings, joints and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

### 3.4 SCHEDULES - PIPING

- A. Plumbing Piping:
  - 1. Domestic Cold Water Interior, Above Grade:
    - a. Glass Fiber Pipe Insulation
      - 1) All pipe sizes: 1 inch thick.
      - 2) Pipes located in walls: ½ inch thick.
  - 2. Domestic Hot Water Interior, Above Grade:

- a. Glass Fiber Pipe Insulation
  - 1) All pipe sizes: 1 inch thick.
  - 2) Pipe located in walls: ½ inch thick.

### 3.5 INSTALLATION – DUCTWORK INSULATION GENERAL

- A. Install in accordance with NAIMA National Insulation Standards.
- B. Insulated ductwork conveying air below ambient temperature:
  - 1. Finish with tape and vapor barrier jacket.
  - 2. Continue insulation through walls, sleeves, hangers and other duct penetrations.
  - 3. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- C. Insulated ductwork conveying air above ambient temperature:
  - 1. Provide with or without standard vapor barrier jacket.
  - 2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

### 3.6 GLASS FIBER, EXTERNAL DUCT WRAP APPLICATION

- A. Apply duct wrap to ducts pulled snug by not so tight as to compress corners more than ¼ inch.
- B. Adjacent sections of duct wrap shall be tightly butted with 2 inch stapling flap overlapping. Seams shall be stapled approximately 6 inches on center with ½ inch minimum steel outward clinching staples. Seal all seams, punctures and tears with mastic. Do not use pressure sensitive tape.
- C. Where rectangular or flat oval ducts are 24 inches width or greater, insulation shall be additionally secured to the bottom of the duct with mechanical fasteners spaced 18 inches on center, not more than 3 inches from edge to prevent sagging. Seal fasteners with mastic.
- D. Cover standing seams, stiffeners, and braces using same blanket insulation with 2 inch jacket lap, staples and mastic.
- E. Stop and point insulation around access and damper operators to allow operation without disturbing wrapping.
- F. Lift ductwork off trapeze hangers and insert spacers.

### 3.7 SCHEDULES – DUCT INSULATION

- A. Conical and straight spin-ins on unlined ducts shall be insulated with 2 inch thick external duct wrap. Split insulation at damper rod and seal vapor tight.
- B. All supply, return, and outside air ductwork: 2 inch thick external duct wrap.

**END OF SECTION 15081**

**SECTION 15410**  
**PLUMBING PIPING**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Pipe, pipe fittings, valves for the following piping systems:
  - 1. Sanitary, waste and vent piping.
  - 2. Domestic, hot and cold water piping.

**1.2 RELATED SECTIONS**

- A. Section 15010 – Basic Mechanical Requirements.
- B. Section 15050 – Basic Materials and Methods.
- C. Section 15060 – Hangers and Supports.
- D. Section 15055 – Motors, Starters and Electrical Equipment.
- E. Section 15075 – Mechanical Identification.
- F. Section 15081 – Mechanical Systems Insulation.

**1.3 SUBMITTALS FOR REVIEW**

- A. Division 1 – Submittals and Section 15010: Procedures for submittals.
- B. Provide product data on the following:
  - 1. Pipe materials, pipe fittings and accessories.
  - 2. Manufacturers catalogue data and cut sheets on all fixtures and equipment.
  - 3. Valve data and ratings.
- C. Manufacturer's drawings of listed closing methods to be used to close penetrations through rated assemblies.

**1.4 QUALITY ASSURANCE**

- A. Perform work in accordance with the local codes and standards.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Identify pipe with marking including size, ASTM material classification.
- D. Give required notices, file drawings and pay for permits, deposits and fees associated with installation of work. Obtain and pay for inspections required by local authorities having jurisdiction.

- E. "Provide" means to furnish and install complete and ready for use.
- F. Closely coordinate shut down and connections to existing systems with owner. Provide written request to owner a minimum of 5 days in advance of shut down. Do not shut down any system without owner's written approval. Perform work after hours, at premium time as necessary.

## 1.5 APPLICABLE CODES & STANDARDS

- A. Comply with current editions of the following Codes and Standards:
  1. NFPA 54 – National Fuel Gas Code, 1999 Edition.
  2. NFPA 70 – National Electrical Code, 1999 Edition.
  3. NFPA 101 – Life Safety Code, 2000 Edition.
  4. Other Standards as referenced in other Sections of Division 15.
  5. Local Building Code (International Building Code, 2009).
  6. Local Plumbing Code (International Plumbing Code, 2009).
  7. Local and State Health Department Standards.
  8. Local Gas Code (International Fuel Gas Code, 2009).

## PART 2 - PRODUCTS

### 2.1 SANITARY WASTE PIPING, BELOW GRADE OR BELOW SLAB ON GRADE

- A. PVC Pipe:
  1. Pipe: Schedule 40, ASTM D2665 or ASTM D3034.
  2. Fittings: PVC with DWV pattern, ASTM D3311.
  3. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
  4. Transition to cast iron to be made maximum 6" above finish floor.

### 2.2 SANITARY WASTE AND VENT PIPING, ABOVE SLAB ON GRADE

- A. Waste and vent piping to be PVC schedule 40.
- B. PVC Pipe:
  1. Pipe: Polymerized vinyl chloride Schedule 40
  2. Fittings: Polymerized vinyl chloride Schedule 40
  3. Joints: Polymerized vinyl chloride Schedule 40
  4. Cement :As per manufacturer's recommendation.

### 2.3 WATER PIPING, ABOVE GRADE

- A. Water piping 2 inch and smaller, copper tube
- B. Water piping: copper tube.
- C. Copper Tubing:
  1. Pipe: ASTM B88, Type L, hard drawn.
  2. Fittings: ASME B16.22, wrought copper and bronze.
  3. Joints: ASTM B32, 95-5 solder, Grade 95TA, lead free with lead free flux.
- D. Insulation:

1. Insulate all water piping (cold, hot) above slab on grade with 1" fiberglass insulation. Insulation thickness may be reduced to ½ "in walls.
2. Insulation shall be installed continuous through walls.
3. See other sections of the specifications for insulation description.

E. Identification:

1. Identify all piping in accordance with section 15075 of the specification.

## 2.4 FLEXIBLE PIPE CONNECTIONS

- F. Stainless steel corrugated tubing with stainless steel wire braid.
- G. Working pressure 200 psi minimum.
- H. End connections 2" and smaller-male pipe threads, larger than 2" flanged.
- I. Manufacturers: Minnesota Flexible Corporation, Metaflex, Flexicraft and Hyspan.

## 2.5 FLANGES, UNIONS, AND COUPLINGS

- J. Pipe Size 2 Inches and Under:
  1. Ferrous pipe: Class 150 malleable iron threaded unions.
  2. Copper tube and pipe: Class 150 bronze unions with soldered joints.
- K. Pipe Size Over 2 Inches:
  1. Ferrous pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
  2. Copper tube and pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- L. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

## 2.6 PIPE HANGERS AND SUPPORTS

A. Hangers:

1. Hangers for Pipe Sizes ½ to 1-1/2 Inch: Carbon steel, adjustable swivel, split ring.
2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods or Unistrut multiuse channel.
4. Wall Support : Welded steel bracket and wrought steel clamp.
5. Vertical Support: Steel riser clamp.
6. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
7. Copper Pipe Support when applied directly to the copper piping: Copper steel ring, adjustable.
8. Install hanger over insulation on insulated pipe with 8" long sheet metal saddle rolled on the ends centered in hanger.
9. Support water piping with-in stud partitions with brackets as manufactured by Sumner Products, P&M Bracket, or Hold-Rite. Wire is not acceptable.

- B. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

- C. For fasteners in existing concrete structures, use drilled in expansion anchors with load rating 150% greater than the pipe hanger rating. Note: Power drive anchors are not acceptable.
- D. Beam Clamps: Grinnell Figure #229.

## 2.7 BALL VALVES

- A. Up to and including 2 inches:
  - 1. Manufacturers:
    - a. Watts Model B-6080 or B-6081, full port.
    - b. Nibco, Apollo, Milwaukee, Kitz.
  - 2. MSS-SP-110 Class 125, bronze body, chrome plated full port ball, ptfе seats and seals, blow-out proof stem and threaded ends.

## 2.8 FIRE STOP SYSTEM

- A. All wall and floor penetrations are to be closed. Refer to the Arch. Life Safety Plans and close all openings with a U.L. Listed assembly compatible with the rating of the wall or floor being penetrated.
- B. Non-rated walls – sheet rock joint compound may be used to seal opening. Insulation to be continuous through wall.
- C. For piping passing through sheet rock walls or partitions:
  - 1. Insulated pipe passing through walls or partitions – Hilti FS605 with sleeve U.L. Listing #WL1056.
  - 2. Insulated pipe passing through 2 hour walls or partitions – Hilti FS611A with no sleeve, U.L. Listing #WL5029. Insulation to be continuous through sleeve.
- D. For piping passing through concrete floors, concrete walls or concrete block walls.
  - 1. Uninsulated Schedule 40 steel on copper pipe: Hiti #F5605 with sleeve, U.L. #CAT155.
  - 2. Insulated Schedule 40 steel on insulated copper pipe: Hilti #FS611A, U.L. #CAT5045.
- E. For non-metallic piping passing through concrete floors, walls or concrete block.
  - 1. 2" and smaller piping: Hilti #FS611A, U.L. #CAT2062 or U.L. #CAT2065.
  - 2. Larger than 2": Hilti #FS611A with collar, U.L. system CAT095.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Cut pipe square and ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.

### 3.2 PIPING INSTALLATION GENERAL

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

- C. Make piping connections to equipment with flanges or unions.
- D. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- E. Run piping concealed, except where specifically shown to be exposed.
- F. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- G. Group piping whenever practical at common elevations.
- H. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment.
- I. Provide clearance in hanger and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 15250.
- J. Provide access where valve are not accessible. Provide minimum 18"x18" access doors at valves in hard ceiling. Access doors shall equal fire rating of ceiling or wall.
- K. Establish elevations of buried pressure piping outside the building to ensure not less than 18 inches of cover.
- L. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- M. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Section 09900.
- N. Install chrome plated floor, wall and ceiling plates on all exposed piping passing through finished surfaces in finished spaces.
- O. Install bell and spigot pipe with bell end upstream.
- P. Install valves with stems upright or horizontal, not inverted.
- Q. Install water piping to ASME B31.9. Provide 18" high air chambers on water supplies to all fixtures.
- R. Pipe Hangers and Supports:
  1. Support horizontal piping as scheduled.
  2. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.
  3. Place hangers within 12 inches of each horizontal elbow.
  4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  5. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
  6. Where several pipes can be installed in parallel and at same elevation, trapeze hangers may be used.
  7. Provide copper hangers and supports when applied directly to copper piping.
  8. Prime coat exposed steel hangers and supports located outdoors, in crawl spaces, pipe shafts. Above suspended ceiling spaces is not considered exposed.
  9. Provide hangers adjacent to motor driven equipment.
  10. Support cast iron drainage and vent piping at every joint and minimum 5'-0" on center.

- S. Provide pipe line markers and valve tags in accordance with other sections of the specifications.

### 3.3 EXCAVATION AND BACKFILLING

- A. Include all excavation and backfilling required to bring the work to line and grade shown, including excavation of rock and all other materials which may be encountered.
- B. Excavate trenches wide enough for proper installation of work. Grade trench bottoms evenly. Provide bell holes as necessary to insure uniform bearing for pipes. Excavate minimum 6" below pipe. Refill cuts below required grade with sand or compacted gravel. Support pipe continuously along its entire length. Do not use piers to support piping.
- C. Backfill after inspection by Contracting Officer or Contracting Officer's Representative and authorities having jurisdiction. Backfill compacted areas with "Engineered Fill", sand or fine gravel in accordance with requirements of Civil section of specifications. Backfill shall be free of rock, wood, steel, brick, etc. Do not disturb pipe.

### 3.4 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install brass male adapters each side of valves in copper piped system.
- C. Install valves for shut-off and to isolate equipment, part of systems, or vertical risers.

### 3.5 ERECTION TOLERANCES

- A. Slope all sanitary waste piping and storm piping at a minimum 1/8" per foot. Slope all sanitary sewer piping 2" and smaller below slab on grade at a minimum 1/4" per foot.
- B. Arrange all water piping to drain to low points and provide ball valve with plug at low point.

### 3.6 SANITARY, WASTE AND VENT SYSTEM

- A. Extend vent stacks thru roof where shown. Vent stacks are in place in some cases.
- B. Connect to existing sanitary piping as required for complete installation. Verify size, location and invert prior to installing any new work.

### 3.7 WATER PIPING SYSTEM

- A. Connect to existing water piping where shown. Verify exact location and size of existing piping. Repair existing insulation at point of new connection.

### 3.8 FIELD QUALITY CONTROL

- A. Perform all tests as required by local codes. Contractor shall furnish testing equipment and keep a record of all testing listing tests made, results and those witnessing test. Include testing record in close out documents.

- B. If local codes are more stringent than the following, local codes shall govern.
  
- C. Sanitary, Waste, Vent Systems:
  - 1. Test piping by stopping lower outlets and filling to 10 feet hydrostatic head for a minimum period of 15 minutes with all joints exposed throughout test. Stop all leaks and retest system until tight.
  - 2. Test all piping by stopping all outlets and applying 5 pounds per square inch of air pressure to the system for a period of 15 minutes. Stop all leaks and retest system until tight.
  - 3. Provide ball test on all piping larger than 3".
  
- D. Domestic Water Piping:
  - 1. Hydrostatic test at 150 psig without pressure drop for 4 hours. Stop all leaks and retest system until free from leaks.
  - 2. Leave City pressure on system for duration of project.

### 3.9 SCHEDULES

- A. Pipe Hanger Spacing:
  - 1. Metal Piping:
    - a. Pipe size: ½ to 1-1/4 inches:
      - 1) Maximum hanger spacing: 6.5 ft.
      - 2) Hanger rod diameter: 3/8 inches.
    - b. Pipe size: 1-½ to 2 inches:
      - 1) Maximum hanger spacing: 10 ft.
      - 2) Hanger rod diameter: 3/8 inches.
    - c. Pipe size: 2-½ to 3 inches:
      - 1) Maximum hanger spacing: 10 ft.
      - 2) Hanger rod diameter: 1/2 inches.
  - 2. Plastic Non-Metallic Piping:
    - a. All Sizes:
      - 1) Maximum hanger spacing: 4 ft.
      - 2) Hanger rod diameter: 3/8 inch.

**END OF SECTION 15410**

**SECTION 15440**  
**PLUMBING FIXTURES**

**PART 1 - GENERAL**

**1.1 SECTION INCLUDES**

- A. Plumbing fixtures.
- B. Plumbing miscellaneous equipment.

**1.2 RELATED SECTIONS**

- A. Section 15010 – Basic Mechanical Requirements.
- B. Section 15050 – Basic Mechanical Materials and Methods.
- C. Section 15060 – Hangers and Supports.
- D. Section 15055 – Motors, Starters and Electrical Equipment.
- E. Section 15075 – Mechanical Identification.
- F. Section 15081 – Mechanical Systems Insulation.

**1.3 SUBMITTALS FOR REVIEW**

- A. See Section 15010, Submittal for Review.
- B. Plumbing Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, trim and finishes.

**1.4 SUBMITTALS AT PROJECT CLOSEOUT**

- A. Refer to Section 15010 – Submittals for Project Closeout.
- B. Maintenance Data: Provide 3 sets of manufacturer's maintenance and parts listing including the manufacturer's nearest sales and service representative. Include the sales representative's address and telephone number. Provide with the listing, a suggested maintenance schedule for all equipment along with warranty dates. Items are to be provided in three ring binders with tabs identifying different equipment types.
- C. Warranty: Submit manufacturer's warranty and ensure forms have been completed in Government's name and registered with manufacturer.

## 1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

## 1.6 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

## 1.7 DELIVERY, STORAGE AND PROTECTION

- A. Accept fixtures on site in factory packaging, inspect for damage and store.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

## 1.8 WARRANTY

- A. See other sections of the specification for additional warranty information.
- B. The Contractor shall warrant all materials, workmanship and equipment for a period of one year from the date of substantial completion. Any defect in equipment or workmanship shall be made known to the Contractor within 1 year. Such deficiencies shall be corrected by the Contractor at no cost to the Government.

## 1.9 EXTRA MATERIALS

- A. See other sections of the specification for additional extra material requirements.
- B. Provide two sets of washers for all faucet types, two flush valve repair kits for all flush valve types.

## PART 2 - PRODUCTS

### 2.1 DRAINS

- A. Floor Drain(FD): J.R. Smith #2005 with Pro Set Trap-Guard assembly.
- B. Floor Sink (FS): J.R. Smith #3400, 12" diameter, 8" deep porcelain enameled cast iron interior, with top grate, with porcelain enameled dome bottom strainer.

### 2.2 CLEANOUTS

- A. Furnish and install cleanouts where indicated on drawings and at all 90-degree bends, angle, upper terminals and not over 75 feet apart on straight runs. All cleanouts to have bronze countersunk tapered slotted plugs. Flush-with-floor cleanout access covers shall have non-skid

covers. All wall cleanout access covers shall have polished satin finish. All cleanouts shall be full size of pipe, piping larger than 6" shall have minimum 6" cleanout covers.

- B. Exposed Cleanouts: Cast brass plug type, J.R. Smith #4470.
- C. Wall type cleanout plug and access covers, J.R. Smith #4472. Cleanout plug must be within 1" of finish wall and must be tapped for access cover.
- D. Install wall cleanouts on stacks at flush valve fixtures 12" above top of flush valve, 12" above finish floor on sinks, lavatories and water coolers and 12" above grab bars at fixtures with grab bars. Locate cleanouts to clear base at floor.
- E. Floor type cleanout access covers: J.R. Smith #4248-NB. Plug must be within 3" of finished floor. Provide J.R. Smith #4188 where installed in tile floors and J.R. Smith #4168 where located in floor with resilient tile. Grout cleanout below access cover to seal watertight.
- F. Coordinate location of cleanouts in finished areas with Contracting Officer or Contracting Officer's Representative.

### 2.3 REDUCED PRESSURE ZONE BACKFLOW PREVENTER AND DOUBLE CHECK VALVE ASSEMBLIES

- A. One (1) inch and larger: Equal to Watts #909 with gate valves and inlet strainer. Provide additional valve upstream of strainer. Clayton, Beeco, Febco, Conbraco, Wilkins or equal. Provide same size as piping.
- B. One-half (½) inch and three-fourth (¾) inch: Watts #9D, Wilkins #750, same size as pipe.
- C. Pipe relief from backflow preventer full size to nearest floor drain. Provide factory air gap for relief connection.
- D. Double check valve assemblies: Watts #709, Clayton or Beeco. Provide with indicating valves on fire protection lines. Non-indicating or ball valves may be used on lines other than fire protection.

### 2.4 PLUMBING FIXTURES AND EQUIPMENT

- A. Unless otherwise specified, all fixtures complete as catalogued, commercial grade, white color, exposed metal trim chromium plated.
- B. Fixtures and brass shall be securely anchored. Carriers shall be securely anchored to floor with bolts in all holes as recommended by the manufacturer.
- C. Handles on A.D.A. water closets to be installed on wide side of room or stall.
- D. Seal wall hung fixtures at wall with white silicone sealant. Seal countertop fixtures with clear silicone sealant.
- E. Mount all fixtures at standard mounting height unless otherwise noted.
- F. All faucets to be furnished with ceramic discs.

- G. Furnish sinks and lavatories with correct number of drillings required for the faucet and accessories. Hole covers are not acceptable.
- H. All similar products shall be by the same manufacturer.
- I. All fixtures noted to be A.D.A. approved must be set with great care to assure proper mounting height and proper distance from wall.
- J. All items complete as catalogued as follows:

P-1 WATER CLOSET (ADA): KOHLER K-4302, SLOAN #8111 BATTERY POWERED, SENSOR FLUSH VALVE COMPLETE WITH YJ SUPPORT. PROVIDE CHURCH 295NSSC SEAT. CONNECT TO EXISTING WASTE AND WATER ROUGH-IN.

P-2 LAVATORY (ADA): KOHLER K2005, MCGUIRE 165 SUPPLY/STOPS, 155A STRAINER AND 8872 P-TRAP. PROVIDE SYMMONS S-6080 BATTERY POWERED SENSOR FAUCET, WITH .5 GPM AERATOR, AND PLUMBEREX #396 TRAP/SUPPLY COVERS. SET WITH RIM AT 34" ABOVE FINISH FLOOR. MODIFY EXISTING WASTE AND WATER ROUGH-IN FOR CONNECTION..

P-3 SINK: ELKAY LR2522, 18 GAUGE STAINLESS STEEL WITH LK-35 WASTE STRAINER, MCGUIRE 165 SUPPLIES/STOPS AND 8912 P-TRAP. PROVIDE SYMMONS S-23-2 FAUCET WITH 1.0 GPM AERATOR.

P-4 THREE COMPARTMENT SINK: ELKAY RNSF83584, 16 GAUGE STAINLESS STEEL COMPLETE WITH (3)LK24RT DRAIN FITTINGS AND (2)LK945AT08L2T FAUCETS. PROVIDE BALL VALVE STOPS ON SUPPLY TO FAUCETS AND EXTEND WASTE TO FLOOR SINK.

ELECTRIC WATER HEATER(EWH-1): LOCHINVAR HST12-082, WITH 80 GALLON STORAGE CAPACITY, 12KW - 208 VOLT - 1 PHASE. REFER TO DETAIL FOR CONNECTION REQUIREMENTS..

## 2.5 FOOD SERVICE EQUIPMENT

- A. All equipment is furnished and set in place under the Food Service Section, unless otherwise noted in food service equipment schedule.
- B. All sink waste outlets, strainers, lever wastes and tailpieces are furnished under Food Service Section.
- C. Under this Section rough and connect in accordance with shop drawings accompanying the equipment.
- D. Under this Section extend all wastes to floor sinks, using D.W.V. copper and securely anchored in the horizontal. Install flow control devices on sink wastes as shown and detailed on drawings.
- E. Receive faucets, furnished under the Food Service Section set, rough, connect and furnish EBC LA10 stops with supplies.
- F. Furnish faucets as specified for each individual piece of equipment.
- G. Furnish EBC TA150 P-Traps where sink, etc., is not piped to a floor sink.

## 2.6 ACCEPTABLE MANUFACTURERS

- A. Where Kohler is listed above, Crane, Toto or American Standard may be substituted.
- B. Where Sloan is listed above, Toto and Zurn may be substituted.
- C. Where J. R. Smith is listed above, Josam, Zurn, Mifab, Watts, or Wade may be substituted.
- D. Where Church is listed above, Bemis, Beneke, Centoco or Olsonite may be substituted.
- E. Where Symmons is listed above, American Standard, Kohler, Zurn or Delta may be substituted, provided manufacturer can furnish all fixture brass specified.
- F. Where McGuire is listed above for traps, outlet strainers and stops, EBC, Zurn or Brass-Craft may be substituted.
- G. Where Plumberex is listed above, Pro-wrap by McGuire, "Handi Lav-Guard" by Truebro or "Trap-Wrap" by Brocar Industries, Inc. may be substituted.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify all electrical characteristics of electrical motors, starters and equipment with Electrical Section. Should the Contractor change the characteristics of the electrical equipment, it shall be the responsibility of the Contractor to coordinate all changes with the other trades and bear all costs of such changes.
- B. Coordinate all cutouts in millwork and casework with supplier for proper cutout dimensions.

- C. Install all fixtures and equipment in accordance with manufacturer's recommendations.
- D. All wall hung fixtures are to be installed on floor mounted fixture supports. Fixture supports are to be anchored to floor with anchors in all mounting holes. Anchors to be sized as per the manufacturers recommendations. Seal all fixtures to walls and floor with white silicone sealant. Seal all sinks to counter tops with clean silicone sealant.
- E. Adjust all stops, flush valves and valves for intended water flow rate.
- F. Clean plumbing fixtures and equipment and remove tags.
- G. Provide wood backing in wall for flush valve YJ brackets, faucet supports, shower valves and shower hand rails. Anchor to the wood backing with anchoring screws of sufficient length to penetrate wood backing.
- H. Provide stops with chrome plated nipples penetrating wall and cover penetrations with chrome plated escutcheons. Note: Compression type stops and plastic stems are not acceptable.

**END OF SECTION 15440**

## SECTION 15815

### METAL DUCTS

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. This Section includes metal ducts for supply, return, outside, and exhaust air-distribution systems in pressure classes from minus 2- to plus 10-inch wg. Metal ducts include the following:
  - 1. Rectangular and round ducts and fittings.
- B. Related Sections include the following:
  - 1. Division 15 Section "Duct Accessories" for dampers, duct-mounting access doors and panels, turning vanes, and flexible ducts.

##### 1.3 SYSTEM DESCRIPTION

- A. Duct system design, as indicated, has been used to select size and type of air-moving and -distribution equipment and other air system components. Changes to layout or configuration of duct system must be specifically approved in writing by Contracting Officer or Contracting Officer's Representative . Accompany requests for layout modifications with calculations showing that proposed layout will provide original design results without increasing system total pressure.

##### 1.4 SUBMITTALS

- A. Shop Drawings: Drawn to 1/4 inch equals 1 foot scale. Show fabrication and installation details for metal ducts.
  - 1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
  - 2. Duct layout indicating sizes and pressure classes.
  - 3. Elevations of top and bottom of ducts.
  - 4. Dimensions of main duct runs from building grid lines.
  - 5. Fittings.
  - 6. Reinforcement and spacing.
  - 7. Seam and joint construction.
  - 8. Penetrations through fire-rated and other partitions.
  - 9. Equipment installation based on equipment being used on Project.
  - 10. Duct accessories, including access doors and panels.
  - 11. Hangers and supports, including methods for duct and building attachment, vibration isolation, and seismic restraints.

##### 1.5 QUALITY ASSURANCE

- A. NFPA Compliance:
  - 1. NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."

2. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

### 2.2 SHEET METAL MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.
- B. Galvanized Sheet Steel: Lock-forming quality; complying with ASTM A 653/A 653M and having G90 coating designation; ducts shall have mill-phosphatized finish for surfaces exposed to view.
- C. Carbon-Steel Sheets: ASTM A 366/A 366M, cold-rolled sheets; commercial quality; with oiled, matte finish for exposed ducts.
- D. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts.
- E. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

### 2.3 SEALANT MATERIALS

- A. Joint and Seam Sealants, General: The term "sealant" is not limited to materials of adhesive or mastic nature but includes tapes and combinations of open-weave fabric strips and mastics.
- B. Water-Based Joint and Seam Sealant: Flexible, adhesive sealant, resistant to UV light when cured, UL 723 listed, and complying with NFPA requirements for Class 1 ducts.
- C. Flanged Joint Mastic: One-part, acid-curing, silicone, elastomeric joint sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.
- D. Flange Gaskets: Butyl rubber or EPDM polymer with polyisobutylene plasticizer.

### 2.4 HANGERS AND SUPPORTS

- A. Building Attachments: Contractor shall provide appropriate structural-steel fasteners appropriate for construction materials to which hangers are being attached.
- B. Hanger Materials: Galvanized sheet steel or threaded steel rod.
  1. Hangers Installed in Corrosive Atmospheres: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

2. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for steel sheet width and thickness and for steel rod diameters.
  3. Galvanized-steel straps attached to aluminum ducts shall have contact surfaces painted with zinc-chromate primer.
- C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.
- D. Trapeze and Riser Supports: Steel shapes complying with ASTM A 36/A 36M.
1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.

## 2.5 RECTANGULAR DUCT FABRICATION

- A. Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" and complying with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.
1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure class.
  2. Deflection: Duct systems shall not exceed deflection limits according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- B. Transverse Joints: Prefabricated slide-on joints and components constructed using manufacturer's guidelines for material thickness, reinforcement size and spacing, and joint reinforcement.
1. Available Manufacturers:
    - a. Ductmate Industries, Inc.
    - b. Nexus Inc.
    - c. Ward Industries, Inc.
- C. Formed-On Flanges: Construct according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," Figure 1-4, using corner, bolt, cleat, and gasket details.
1. Manufacturers:
    - a. Ductmate Industries, Inc.
    - b. Lockformer.
  2. Duct Size: Maximum 30 inches wide and up to 2-inch wg pressure class.
  3. Longitudinal Seams: Pittsburgh lock sealed with noncuring polymer sealant.
- D. Cross Breaking or Cross Beading: Cross break or cross bead duct sides 19 inches and larger and 0.0359 inch thick or less, with more than 10 sq. ft. of nonbraced panel area unless ducts are lined.

## 2.6 ROUND DUCT AND FITTING FABRICATION

- A. Round, Spiral Lock Seam Ducts: Fabricate supply ducts of galvanized steel according to SMACNA's "HVAC Duct Construction Standards--Metal and Flexible."
- B. Duct Joints:
1. Ducts up to 20 Inches in Diameter: Interior, center-beaded slip coupling, sealed before and after fastening, attached with sheet metal screws.

2. Ducts 21 to 72 Inches in Diameter: Three-piece, gasketed, flanged joint consisting of two internal flanges with sealant and one external closure band with gasket.
  3. Round Ducts: Prefabricated connection system consisting of double-lipped, EPDM rubber gasket. Manufacture ducts according to connection system manufacturer's tolerances.
    - a. Manufacturers:
      - 1) Ductmate Industries, Inc.
      - 2) Lindab Inc.
- C. 90-Degree Tees and Laterals and Conical Tees: Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," with metal thicknesses specified for longitudinal-seam straight ducts.
- D. Diverging-Flow Fittings: Fabricate with reduced entrance to branch taps and with no excess material projecting from fitting onto branch tap entrance.
- E. Fabricate elbows using die-formed, gored, pleated, or mitered construction. Bend radius of die-formed, gored, and pleated elbows shall be 1-1/2 times duct diameter unless noted otherwise on plans. Unless elbow construction type is indicated, fabricate elbows as follows:
1. Mitered-Elbow Radius and Number of Pieces: Welded construction complying with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible," unless otherwise indicated.
  2. Round Mitered Elbows: Welded construction with the following metal thickness for pressure classes from minus 2- to plus 2-inch wg:
    - a. Ducts 3 to 36 Inches in Diameter: 0.034 inch.
    - b. Ducts 37 to 50 Inches in Diameter: 0.040 inch.
    - c. Ducts 52 to 60 Inches in Diameter: 0.052 inch.
    - d. Ducts 62 to 84 Inches in Diameter: 0.064 inch.
  3. Round Mitered Elbows: Welded construction with the following metal thickness for pressure classes from 2- to 10-inch wg:
    - a. Ducts 3 to 26 Inches in Diameter: 0.034 inch.
    - b. Ducts 27 to 50 Inches in Diameter: 0.040 inch.
    - c. Ducts 52 to 60 Inches in Diameter: 0.052 inch.
    - d. Ducts 62 to 84 Inches in Diameter: 0.064 inch.
  4. 90-Degree, 2-Piece, Mitered Elbows: Use only for supply systems or for material-handling Class A or B exhaust systems and only where space restrictions do not permit using radius elbows. Fabricate with single-thickness turning vanes.
  5. Round Elbows 8 Inches and Less in Diameter: Fabricate die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60, and 90 degrees only. Fabricate nonstandard bend-angle configurations or nonstandard diameter elbows with gored construction.
  6. Round Elbows 9 through 14 Inches in Diameter: Fabricate gored or pleated elbows for 30, 45, 60, and 90 degrees unless space restrictions require mitered elbows. Fabricate nonstandard bend-angle configurations or nonstandard diameter elbows with gored construction.

### PART 3 - EXECUTION

### 3.1 DUCT APPLICATIONS

A. Unless otherwise noted, construct ducts according to the following schedule:

AIR SYSTEM	MATERIAL	PRESSURE CLASS	SEAL CLASS
Supply return and exhaust ducts	Galvanized	2"	C

### 3.2 DUCT INSTALLATION

- A. Construct and install ducts according to SMACNA's "HVAC Duct Construction Standards-  
-Metal and Flexible," unless otherwise indicated.
- B. Install round ducts in lengths not less than 12 feet unless interrupted by fittings.
- C. Install ducts with fewest possible joints.
- D. Install fabricated fittings for changes in directions, size, and shape and for connections.
- E. Install couplings tight to duct wall surface with a minimum of projections into duct.  
Secure couplings with sheet metal screws. Install screws at intervals of 12 inches, with a  
minimum of 3 screws in each coupling.
- F. Install ducts, unless otherwise indicated, vertically and horizontally and parallel and  
perpendicular to building lines; avoid diagonal runs.
- G. Install ducts close to walls, overhead construction, columns, and other structural and  
permanent enclosure elements of building.
- H. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.
- I. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid  
partitions unless specifically indicated.
- J. Coordinate layout with suspended ceiling, lighting layouts, and similar finished work.
- K. Seal all joints and seams. Apply sealant to male end connectors before insertion, and  
afterward to cover entire joint and sheet metal screws.
- L. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and  
exterior walls and are exposed to view, conceal spaces between construction openings  
and ducts or duct insulation with sheet metal flanges of same metal thickness as ducts.  
Overlap openings on 4 sides by at least 1-1/2 inches.
- M. Protect duct interiors from the elements and foreign materials until building is enclosed.  
Follow SMACNA's "Duct Cleanliness for New Construction."

### 3.3 HANGING AND SUPPORTING

- A. Support horizontal ducts within 24 inches of each elbow and within 48 inches of each  
branch intersection.
- B. Support vertical ducts at maximum intervals of 16 feet and at each floor.

- C. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.

### 3.4 CONNECTIONS

- A. Make connections to equipment with flexible connectors according to Division 15 Section "Duct Accessories."
- B. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

### 3.5 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections according to SMACNA's "HVAC Air Duct Leakage Test Manual" and prepare test reports:
  1. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
  2. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If pressure classes are not indicated, test entire system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure. Give seven days' advance notice for testing.
  3. Maximum Allowable Leakage: Comply with requirements for Leakage Class 8 for round ducts, Leakage Class 16 for rectangular ducts in pressure classes lower than and equal to 2-inch wg (both positive and negative pressures).
  4. Remake leaking joints and retest until leakage is equal to or less than maximum allowable.

### 3.6 CLEANING NEW SYSTEMS

- A. Mark position of dampers and air-directional mechanical devices before cleaning, and perform cleaning before air balancing.
- B. Use service openings, as required, for physical and mechanical entry and for inspection.
  1. Create other openings to comply with duct standards.
  2. Disconnect flexible ducts as needed for cleaning and inspection.
  3. Remove and reinstall ceiling sections to gain access during the cleaning process.
- C. Vent vacuuming system to the outside. Include filtration to contain debris removed from HVAC systems, and locate exhaust down wind and away from air intakes and other points of entry into building.
- D. Clean the following metal duct systems by removing surface contaminants and deposits:
  1. Air outlets and inlets (registers, grilles, and diffusers).
  2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
  3. Supply-air ducts, dampers, actuators, and turning vanes.
- E. Mechanical Cleaning Methodology:
  1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.

2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.
  3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
- F. Cleanliness Verification:
1. Visually inspect metal ducts for contaminants.
  2. Where contaminants are discovered, re-clean and reinspect ducts.

END OF SECTION

## SECTION 15820

### DUCT ACCESSORIES

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Volume dampers.
  - 2. Turning vanes.
  - 3. Duct-mounting access doors.
  - 4. Flexible connectors.
  - 5. Flexible ducts.
  - 6. Duct accessory hardware.

##### 1.3 SUBMITTALS

- A. Product Data: For the following:
  - 1. Volume dampers.
  - 2. Turning vanes.
  - 3. Duct-mounting access doors.
  - 4. Flexible connectors.
  - 5. Flexible ducts.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Special fittings.
  - 2. Manual-volume damper installations.

##### 1.4 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

#### PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

## 2.2 SHEET METAL MATERIALS

- A. Comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated.
- B. Galvanized Sheet Steel: Lock-forming quality; complying with ASTM A 653/A 653M and having G90 coating designation; ducts shall have mill-phosphatized finish for surfaces exposed to view.
- C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.
- D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

## 2.3 VOLUME DAMPERS

- A. Manufacturers:
  - 1. METALAIRE, Inc.
  - 2. Nailor Industries Inc.
  - 3. Ruskin Company.
- B. General Description: Factory fabricated, with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.
  - 1. Pressure Classes of 3-Inch wg or Higher: End bearings or other seals for ducts with axles full length of damper blades and bearings at both ends of operating shaft.
- C. Standard Volume Dampers: Multiple- or single-blade, parallel- or opposed-blade design as indicated, standard leakage rating, **with linkage outside airstream**, and suitable for horizontal or vertical applications.
  - 1. Steel Frames: Hat-shaped, galvanized sheet steel channels, minimum of 0.064 inch thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls and flangeless frames where indicated for installing in ducts.
  - 2. Roll-Formed Steel Blades: 0.064-inch- thick, galvanized sheet steel.
  - 3. Aluminum Frames: Hat-shaped, 0.10-inch- thick, aluminum sheet channels; frames with flanges where indicated for attaching to walls; and flangeless frames where indicated for installing in ducts.

4. Roll-Formed Aluminum Blades: 0.10-inch- thick aluminum sheet.
  5. Extruded-Aluminum Blades: 0.050-inch- thick extruded aluminum.
  6. Blade Axles: Nonferrous.
  7. Bearings: Molded synthetic.
  8. Tie Bars and Brackets: Aluminum.
  9. Tie Bars and Brackets: Galvanized steel.
- D. Spin Ins:
1. Branch duct connections for connecting round low pressure duct to rectangular low pressure ducts.
  2. Galvanized steel, straight spin-in with beaded collar, integral damper and quadrant stand-off. Minimum 26 gage.
  3. Manufacturer: Flexmaster FL with stand-off or equivalent.
- E. Jackshaft: 1-inch- diameter, galvanized-steel pipe rotating within pipe-bearing assembly mounted on supports at each mullion and at each end of multiple-damper assemblies.
1. Length and Number of Mountings: Appropriate to connect linkage of each damper in multiple-damper assembly.
- F. Damper Hardware: Zinc-plated, die-cast core with dial and handle made of 3/32-inch-thick zinc-plated steel, and a 3/4-inch hexagon locking nut. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting.

## 2.4 TURNING VANES

- A. Fabricate to comply with SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for vanes and vane runners. Vane runners shall automatically align vanes.
- B. Manufactured Turning Vanes: Fabricate 1-1/2-inch- wide, single vane, curved blades of galvanized sheet steel set 3/4 inch o.c.; support with bars perpendicular to blades set 2 inches o.c.; and set into vane runners suitable for duct mounting.
1. Manufacturers:
    - a. Ductmate Industries, Inc.
    - b. Duro Dyne Corp.
    - c. METALAIRE, Inc.

## 2.5 DUCT-MOUNTING ACCESS DOORS

- A. General Description: Fabricate doors airtight and suitable for duct pressure class.
- B. Door for Low Pressure Ducts: Double wall, duct mounting, and rectangular; fabricated of galvanized sheet metal with insulation fill and thickness as indicated for duct pressure class. Include vision panel where indicated. Include 1-by-1-inch butt or piano hinge and cam latches.
1. Manufacturers:
    - a. CESCO Products.
    - b. Ductmate Industries, Inc.
    - c. Flexmaster U.S.A., Inc.
    - d. Greenheck.
    - e. Nailor Industries Inc.

2. Frame: Galvanized sheet steel, with bend-over tabs and foam gaskets.
  3. Provide number of hinges and locks as follows:
    - a. Less Than 12 Inches Square: Secure with two sash locks.
    - b. Up to 18 Inches Square: Two hinges and two sash locks.
    - c. Up to 24 by 48 Inches: Three hinges and two compression latches with outside and inside handles.
    - d. Sizes 24 by 48 Inches and Larger: One additional hinge.
- C. Door: Double wall, duct mounting, and round; fabricated of galvanized sheet metal with insulation fill and 1-inch thickness. Include cam latches.
1. Manufacturers:
    - a. Ductmate Industries, Inc.
    - b. Flexmaster U.S.A., Inc.
  2. Frame: Galvanized sheet steel, with spin-in notched frame.
- D. Seal around frame attachment to duct and door to frame with neoprene or foam rubber.
- E. Insulation: 1-inch- thick, fibrous-glass or polystyrene-foam board.

## 2.6 FLEXIBLE CONNECTORS

- A. Manufacturers:
1. Ductmate Industries, Inc.
  2. Duro Dyne Corp.
  3. Ventfabrics, Inc.
  4. Ward Industries, Inc.
- B. General Description: Flame-retardant or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1.
- C. Metal-Edged Connectors: Factory fabricated with a fabric strip **3-1/2 inches** wide attached to two strips of 2-3/4-inch- wide, 0.028-inch- thick, galvanized sheet steel or 0.032-inch- thick aluminum sheets. Select metal compatible with ducts.
- D. Indoor System, Flexible Connector Fabric: Glass fabric double coated with neoprene.
1. Minimum Weight: 26 oz./sq. yd..
  2. Tensile Strength: 480 lbf/inch in the warp and 360 lbf/inch in the filling.
  3. Service Temperature: Minus 40 to plus 200 deg F.
- E. Outdoor System, Flexible Connector Fabric: Glass fabric double coated with weatherproof, synthetic rubber resistant to UV rays and ozone.
1. Minimum Weight: 24 oz./sq. yd..
  2. Tensile Strength: 530 lbf/inch in the wrap and 440 lbf/inch in the filling.
  3. Service Temperature: Minus 50 to plus 250 deg F.
- F. High-Temperature System, Flexible Connectors: Glass fabric coated with silicone rubber.
1. Minimum Weight: 16 oz./sq. yd..

2. Tensile Strength: 285 lbf/inch in the wrap and 185 lbf/inch in the filling.
3. Service Temperature: Minus 67 to plus 500 deg F.

## 2.7 FLEXIBLE DUCTS

- A. General: Comply with UL 181, Class 1.
- B. Insulated Flexible Ducts Located Downstream of Air Terminal Units and Low Pressure AC Units (Low Pressure):
  1. Manufacturers:
    - a. Flex Master Type 5.
    - b. Technaflex WK.
    - c. Thermoflex M-KE.
  2. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring coated or galvanized steel wire; fiberglass insulation; polyethylene vapor barrier film.
  3. Pressure Rating: 6 inches WG positive and 4.0 WG negative (4-16 inch ID).
  4. Maximum Velocity: 4000 fpm.
  5. Temperature Range: 20 degrees F to 210 degrees F.

## 2.8 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

## PART 3 - EXECUTION

### 3.1 APPLICATION AND INSTALLATION

- A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for metal ducts.
- B. Provide duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.
- C. Provide balancing dampers at points on supply, return, and exhaust systems where branches lead from larger ducts as required for air balancing. Install at a minimum of two duct widths from branch takeoff.
- D. Install duct access doors to allow for inspecting, adjusting, and maintaining accessories and terminal units as follows:
  1. On both sides of electric duct heater duct coils.
  2. Downstream from volume dampers, turning vanes, and equipment.

3. On sides of ducts where adequate clearance is available.
- E. Install the following sizes for duct-mounting, rectangular access doors:
  1. One-Hand or Inspection Access: 8 by 5 inches.
  2. Two-Hand Access: 12 by 6 inches.
  3. Head and Hand Access: 18 by 10 inches.
  4. Head and Shoulders Access: 21 by 14 inches.
  5. Body Access: 25 by 14 inches.
- F. Label access doors according to Division 15 Section "Mechanical Identification."
- G. Install flexible connectors immediately adjacent to equipment in ducts associated with fans and motorized equipment supported by vibration isolators.
- H. Connect flexible ducts to metal ducts with draw bands.

### 3.2 ADJUSTING

- A. Adjust duct accessories for proper settings.
- B. Final positioning of manual-volume dampers is specified in Division 15 Section "Testing, Adjusting, and Balancing."

END OF SECTION 15820

## SECTION 15950

### TESTING, ADJUSTING, AND BALANCING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. This Section includes TAB to produce design objectives for the following:
  - 1. Air Systems.

##### 1.3 DEFINITIONS

- A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
- B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to indicated quantities.
- C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.
- D. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.
- E. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
- F. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
- G. TAB: Testing, adjusting, and balancing.

##### 1.4 SUBMITTALS

- A. Qualification Data: Submit evidence that TAB firm and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article and below.
- B. Sample Report Forms: Submit sample TAB report forms.
- C. Certified TAB Reports: Submit three copies of reports prepared, as specified in this Section, on approved forms certified by TAB firm.

## 1.5 QUALITY ASSURANCE

- A. TAB Firm Qualifications: Engage a TAB firm certified by either AABC or NEBB.
- B. Certification of TAB Reports: Certify TAB field data reports. This certification includes the following:
  - 1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
  - 2. Certify that TAB team complied with approved TAB plan and the procedures specified and referenced in this Specification.
- C. TAB Report Forms: Use TAB firm's forms approved by Architect.
- D. Instrumentation Type, Quantity, and Accuracy: As described in AABC's "National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."
- E. Instrumentation Calibration: Calibrate instruments at least every six months or more frequently if required by instrument manufacturer.
  - 1. Keep an updated record of instrument calibration that indicates date of calibration and the name of party performing instrument calibration.

## 1.6 PROJECT CONDITIONS

- A. Government Occupancy: AAFES occupies the areas of building outside the work area. Cooperate with AAFES during TAB operations to minimize conflicts with AAFES operations.

## 1.7 COORDINATION

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist TAB activities.
- B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine approved submittal data of HVAC systems and equipment.
- B. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Sections have been performed.
- C. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and that their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.

- D. Examine HVAC equipment to ensure that clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- E. Examine equipment for installation and for properly operating safety interlocks and controls.
- F. Examine automatic temperature system components to verify the following:
  1. Dampers, valves, and other controlled devices are operated by the intended controller.
  2. Dampers and valves are in the position indicated by the controller.
  3. Integrity of dampers for free and full operation and for tightness of fully closed and fully open positions.
  4. Thermostats are located to avoid adverse effects of sunlight, drafts, and cold walls.
  5. Sensors are located to sense only the intended conditions.
  6. Sequence of operation for control modes is according to the Contract Documents.
  7. Controller set points are set at indicated values.
  8. Interlocked systems are operating.
  9. Changeover from heating to cooling mode occurs according to indicated values.
- G. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

### 3.2 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems" or NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to insulation Specifications for this Project.
- C. Mark equipment and balancing device settings with paint or other suitable, permanent identification material, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) and metric (SI) units.

### 3.3 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Prepare schematic diagrams of systems' "as-built" duct layouts.
- C. Verify that motor starters are equipped with properly sized thermal protection.

- D. Check dampers for proper position to achieve desired airflow path.
- E. Check for airflow blockages.
- F. Check for proper sealing of air duct system.

### 3.4 PROCEDURES FOR MOTORS

- A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:
  - 1. Manufacturer, model, and serial numbers.
  - 2. Motor horsepower rating.
  - 3. Motor rpm.
  - 4. Efficiency rating.
  - 5. Nameplate and measured voltage, each phase.
  - 6. Nameplate and measured amperage, each phase.
  - 7. Starter thermal-protection-element rating.
- B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass for the controller to prove proper operation. Record observations, including controller manufacturer, model and serial numbers, and nameplate data.

### 3.5 PROCEDURES FOR COMMERCIAL KITCHEN HOODS

- A. Measure, adjust, and record the airflow of each kitchen hood. For kitchen hoods designed with integral makeup air, measure and adjust the exhaust and makeup airflow. Measure airflow by duct Pitot-tube traverse. If a duct Pitot-tube traverse is not possible, provide an explanation in the report of the reason(s) why and also the reason why the method used was chosen.
  - 1. Install welded test ports in the sides of the exhaust duct for the duct Pitot-tube traverse. Install each test port with a threaded cap that is liquid tight.
- B. After balancing is complete, do the following:
  - 1. Measure and record the static pressure at the hood exhaust-duct connection.
  - 2. Measure and record the hood face velocity. Make measurements at multiple points across the face of the hood. Perform measurements at a maximum of 12 inches (300 mm) between points and between any point and the perimeter. Calculate the average of the measurements recorded.
- C. Visually inspect the hood exhaust duct throughout its entire length. Begin at the hood connection and end at the point it discharges outdoors. Report findings.
  - 1. Check duct slopes as required.
  - 2. Verify that duct access is installed as required.
  - 3. Verify that point of termination is as required.
  - 4. Verify that duct air velocity is within the range required.
  - 5. Verify that duct is within a fire-rated enclosure.
- D. Report deficiencies.

### 3.6 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

- A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.
  - 1. Measure and record the operating speed, airflow, and static pressure of each fan.

2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
  3. Check the condition of filters.
  4. Check the condition of coils.
  5. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.
- B. Before performing testing, balancing of existing systems, inspect existing equipment that is to remain, and be reused to verify that existing equipment has been cleaned and refurbished.
1. New filters are installed.
  2. Coils are clean and fins combed.
  3. Drain pans are clean.
  4. Fans are clean.
  5. Bearings and other parts are properly lubricated.
  6. Deficiencies noted in the preconstruction report are corrected.
- C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.
1. Compare the indicated airflow of the renovated work to the measured fan airflows and determine the new fan, speed, filter, and coil face velocity.
  2. If calculations increase or decrease the airflow rates by more than 5 percent, make equipment adjustments to achieve the calculated airflow flow rates. If 5 percent or less, equipment adjustments are not required.
  3. Air balance each air outlet.

### 3.7 TOLERANCES

- A. Set HVAC system airflow and water flow rates within the following tolerances:
1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus 10 to minus 10 percent.

### 3.8 REPORTING

- A. Status Reports: As Work progresses, prepare reports to describe deficiencies and problems found in systems being tested and balanced.

### 3.9 FINAL REPORT

- A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, bound, tabulated and divided into sections by tested and balanced systems.
- B. Include a certification sheet in front of binder signed by the certified testing and balancing Agent.
1. Include a list of instruments used for procedures, along with proof of calibration.
- C. General Report Data: In addition to form titles and entries, include the following data in the final report, as applicable:
1. Title page.
  2. Name and address of TAB firm.
  3. Project name.
  4. Project location.
  5. Architect's name and address.
  6. Engineer's name and address.
  7. Contractor's name and address.

8. Report date.
  9. Signature of TAB firm who certifies the report.
  10. Table of Contents.
  11. Summary of contents including the following:
    - a. Indicated versus final performance.
    - b. Notable characteristics of systems.
    - c. Description of system operation sequence if it varies from the Contract Documents.
  12. Nomenclature sheets for each item of equipment.
  13. Data for terminal units, including manufacturer, type and size.
  14. Notes to explain why certain final data in the body of reports varies from indicated values.
  15. Test conditions for fans and pump performance forms including the following:
    - a. Settings for outside-, return-, and exhaust-air dampers.
    - b. Conditions of filters.
    - c. Face and bypass damper settings at coils.
    - d. Fan drive settings including settings and percentage of maximum pitch diameter.
    - e. Settings for supply-air, static-pressure controller.
    - f. Other system operating conditions that affect performance.
- D. System Diagrams: Include schematic layouts of air distribution systems. Present each system with single-line diagram and include the following:
1. Quantities of outside, supply, return, and exhaust airflows.
  2. Terminal units.
  3. Balancing stations.
- E. Air-Handling Unit Test Reports: For air-handling units with coils, include the following:
1. Unit Data: Include the following:
    - a. Unit identification.
    - b. Location.
    - c. Make and type.
    - d. Model number and unit size.
    - e. Manufacturer's serial number.
    - f. Sheave make, size in inches (mm), and bore.
    - g. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).
    - h. Number of belts, make, and size.
    - i. Number of filters, type, and size.
  2. Motor Data:
    - a. Make and frame type and size.
    - b. Horsepower and rpm.
    - c. Volts, phase, and hertz.
    - d. Full-load amperage and service factor.
    - e. Sheave make, size in inches (mm), and bore.
    - f. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).
  3. Test Data (Indicated and Actual Values):
    - a. Total airflow rate in cfm (L/s).
    - b. Total system static pressure in inches wg (Pa).
    - c. Fan rpm.
    - d. Discharge static pressure in inches wg (Pa).
    - e. Filter static-pressure differential in inches wg (Pa).
    - f. Preheat coil static-pressure differential in inches wg (Pa).
    - g. Cooling coil static-pressure differential in inches wg (Pa).
    - h. Heating coil static-pressure differential in inches wg (Pa).

- i. Outside airflow in cfm (L/s).
  - j. Return airflow in cfm (L/s).
- F. Fan Test Reports: For supply, return, and exhaust fans, include the following:
  - 1. Fan Data:
    - a. System identification.
    - b. Location.
  - 2. Motor Data:
    - a. Make and frame type and size.
    - b. Horsepower and rpm.
    - c. Volts, phase, and hertz.
    - d. Full-load amperage and service factor.
    - e. Sheave make, size in inches (mm), and bore.
    - f. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).
    - g. Number of belts, make, and size.
  - 3. Test Data (Indicated and Actual Values):
    - a. Total airflow rate in cfm (L/s).
    - b. Total system static pressure in inches wg (Pa).
    - c. Fan rpm.
    - d. Discharge static pressure in inches wg (Pa).
    - e. Suction static pressure in inches wg (Pa).
- G. Instrument Calibration Reports:
  - 1. Report Data:
    - a. Instrument type and make.
    - b. Serial number.
    - c. Application.
    - d. Dates of calibration.

### 3.10 INSPECTIONS

- A. Before final acceptance of the Tab Report::
  - 1. Contracting Officer or Contracting Officer's Representative shall randomly select measurements documented in the final report to be rechecked. The rechecking shall be limited to either 10 percent of the total measurements recorded, or the extent of measurements that can be accomplished in a normal 8-hour business day.
  - 2. If the rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
  - 3. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.
  - 4. TAB firm shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes and resubmit the final report.
  - 5. Request a second final inspection.

**END OF SECTION 15950**

## **SECTION 16000**

### **ELECTRICAL WORK - GENERAL**

#### **PART 1 - GENERAL**

##### **1.01. WORKMANSHIP AND MATERIALS**

All work shall be executed in a workmanlike manner so as to insure a high quality job and to present a neat and mechanical appearance when completed. All materials used shall be new and UL approved for their intended use where such standards have been established.

##### **1.02. CODES, PERMITS AND INSPECTIONS**

Work included in this section shall comply with all applicable laws of the community and with the latest edition of the National Electrical Code where it is not in conflict with those laws. The contractor shall obtain and pay for all necessary permits required to perform the work outlined herein and on the drawings. Upon completion of the work the contractor shall submit a certificate of final inspection and approval from the local Electrical Inspector's office (or the authority having jurisdiction, certifying that the installation complies all applicable regulations governing the same. Once bids are taken, changes to the drawings and/or specifications made necessary by code requirements shall be performed at no additional cost.

##### **1.03. DRAWINGS AND SPECIFICATIONS**

The contract drawings and these specifications shall be considered as complimentary each to the other. What is called for by one shall be considered binding as if called for by both. Where conflicts occur, secure clarification from the Contracting Officer or his designated representative prior to submitting bids; otherwise, provide for the more costly quality or quantity. The drawings are diagrammatic and dimension figures should be followed in preference to scaling; verify dimensions with the architectural drawings and with field conditions.

##### **1.04. SITE CONDITIONS**

Before submitting a bid the Contractor shall visit the project site and ascertain all existing conditions. Adjustment to the work made necessary by actual field conditions shall be made at no additional cost. Routing of underground feeders and circuits may be adjusted to suit actual conditions encountered.

##### **1.05. COORDINATION WITH OTHER TRADES**

Coordinate the work in this section so as to conform with the progress of the work of the other trades. Phasing of the work shall be done as soon as possible with the entire installation completed as soon as the condition of the building permits.

##### **1.06. PROPOSED SUBSTITUTIONS**

Manufacturers' names and catalog numbers are used in the contract documents to generally establish a desired type, style and/or quality level. This is not to be construed as favoring one manufacturer over another; substitutions of equal products will be considered according to the following conditions. Where substitutions are submitted in duplicate at least ten(10) days prior to bid date. One copy of the submittal will be kept on file and the second copy returned by mail indicating acceptability of the substitutions. See section 01300 also and comply.

### **1.07. WORK INCLUDED IN OTHER SECTIONS**

Portions of work related to this section to be done by others include: finished painting of conduits, equipment, etc. (except wood backboards), furnishing and setting in place of all motors, furnishing and installation of all control devices and circuits (except for control devices in power circuits which are to be included as a part of this section).

### **1.08. EQUIPMENT IDENTIFICATION**

Nameplates shall be provided for various items of equipment as listed herein. The nameplate shall be fabricated from laminated phenolic to provide engraved white letters on a black background with chamfered edges. Nameplates shall be fastened to the equipment with at least two metal pins or screws. Letter sizes shall be as follows:

<u>Minimum 1/4 Inch Letters</u>	<u>Minimum 1/8 Inch Letters</u>
Switchboards	Starters
Panelboards	Safety Switches
Transformers	Control Devices (Timeswitches, Telephone Cabinets, Contactors, Etc.)
Motor Control Centers	

### **1.09. CUTTING AND PATCHING**

Where possible, all work shall be built in as the job progresses. Where this is not possible, secure the Contracting Officer or designated representative's approval for any cutting, chasing, etc. that is required. All cut surfaces shall be repaired by skilled mechanics of the trade involved.

### **1.10. TRENCHING AND BACKFILLING**

Perform all excavation necessary for installation of the work shown; do not backfill until all work is completed and inspected. Backfill within the building and under paved areas shall meet compaction requirements established under other sections of these specifications; fill material shall be pit run gravel or similar granular material. Avoid all existing utilities; any existing utilities damaged shall be repaired as directed by the Contracting Officer. Restore any damaged paving to match existing.

### **1.11. TESTING**

Upon completion of the work, conduct a thorough test in the Contracting Officer or designated representative's presence to show the entire system to be in perfect working condition.

**END OF SECTION**

## **SECTION 16100**

### **RACEWAYS**

#### **PART 1 - GENERAL**

##### **1.01. RACEWAY TYPES**

Conduit raceways shall be galvanized rigid steel, galvanized intermediate grade, galvanized electrical metallic tubing, rigid aluminum, galvanized flexible steel, liquid-tight flexible steel or plastic as required by Code and as herein specified.

#### **PART 2 - PRODUCTS**

##### **2.01. MANUFACTURERS**

- A. Rigid Steel Conduit, Intermediate Grade Conduit : Shall be galvanized with threaded fittings; Pittsburgh, Republic or equal.
- B. Electrical Metallic Tubing : Shall be galvanized with compression or set screw type connectors; Pittsburgh, Republic or equal.
- C. Rigid Aluminum Conduit : Shall be heavy-wall type with threaded fittings.
- D. Flexible Steel : Shall be galvanized with set screw fittings.
- E. Liquid-Tight Flexible Steel : Shall have a galvanized steel core covered by a liquid-tight PVC jacket and compression type liquid-tight fittings; Anaconda.
- F. Plastic (PVC) : Shall be heavy wall type rated for direct burial; Carlon.

#### **PART 3 - EXECUTION**

##### **3.01. INSTALLATION CONDITIONS**

- A. Underground : Coated rigid steel or heavy-wall PVC conduit.
- B. Slab on grade and areas subject to moisture : Rigid steel conduit.
- C. Poured concrete and slabs other than on grade : Rigid steel or intermediate grade conduit.
- D. Overhead and in wall cavities in dry locations : Rigid steel, intermediate grade, electrical metallic tubing or rigid aluminum conduit.
- E. Exposed conduit in areas subject to physical damage : Rigid steel or intermediate grade conduit.
- F. Final connections to light fixtures : Flexible steel conduit (6'-0" maximum).
- G. Final connections to transformers, motors and equipment in mechanical rooms and outdoors : Liquid-tight flexible steel conduit.

### **3.02. INSTALLATION EXECUTION**

A. General: Conduit is to be installed concealed except in equipment rooms and where exposed runs are specifically indicated. Exposed conduits shall be installed parallel with or at right angles to walls, ceilings, structural members, etc. The conduit layout shown on the drawings is diagrammatic only and must be adjusted for actual conditions. Offsets are not shown and must be furnished as required. Keep conduit runs at least 12 inches away from parallel runs of flues, steam pipes and other heat producing sources. Conduit sizes shall not be smaller than shown on the drawings and shall comply with Chapter 9 of the NEC where no size is indicated; the minimum size shall be 1/2".

B. Support: All conduits shall be securely supported within 3 feet of each outlet box, junction box, cabinet, termination, fitting, etc. and at intervals not exceeding 8 feet between. Conduit support shall be as required by paragraphs 346-12 and 348-12 of the NEC. Fastening methods shall employ lead expansion anchors or powder-driven fasteners in concrete, toggle bolts in hollow walls, lead expansion anchors in masonry, wood, sheet metal screws in sheet metal and clamps on bar joists and equipment frames. Conduit shall not be welded nor tied with wires to provide support.

C. Underground: Where rigid steel conduit is installed underground, the conduit and couplings shall be provided with a factory applied PVC coating or shall be painted with 2 coats of asphaltum paint. If plastic conduit is used for below ground runs the turn up through the floor shall be made with a rigid steel elbow. Plastic conduit used for underground service entrance shall be encased in 2 inches of concrete; minimum. All runs of plastic conduit shall be provided with a properly sized ground wire.

D. In Slab: The overall diameter of any conduit installed in a slab shall not exceed 1/3 the slab thickness. Run the conduit in the center of the slab and route to avoid displacing the reinforcing steel. Conduit support may be obtained by tying to the reinforcing steel.

E. Bends: Conduit ends shall be cut square, reamed smooth and fully inserted into fittings. Bends shall be made with a proper hickey or bending machine. Make no bends less than 6 times the conduit diameter, nor more than 90 degrees. Crushed or deformed conduit shall not be installed; where damage occurs after installation the damaged conduit shall be replaced. Cap conduit ends with plastic caps or plugs during construction to keep out debris; taping is not acceptable.

F. Bushings: Where raceway is terminated not in an enclosure, such as at a backboard or in a furred space, provide insulated throat bushings. Field insertable throats are not acceptable. Provide all empty conduits with no. 14 galvanized steel pull wire with 12 inches free at each end.

**END OF SECTION**

## **SECTION 16120**

### **OUTLET BOXES**

#### **PART 1 - GENERAL**

##### **1.01. GENERAL**

Unless noted otherwise, boxes shall be galvanized sheet steel 1/16 inch thick minimum, at least 1 1/2 inches deep. Boxes shall be sized to accommodate the devices and conductors indicated in accordance with NEC Article 370. Boxes not cast in concrete or set in masonry shall be fastened to the building structure in the same manner as specified for conduit.

##### **1.02. BOX TYPES**

A. Ceiling and wall bracket outlets shall be 4 inch octagonal boxes with plaster rings as appropriate for the finished surface.

B. Switch outlets, receptacle outlets and auxiliary system outlets shall be 4 inch square boxes with 3/4 inch plaster rings where used in plaster or drywall, 1 inch plaster rings where set in exposed concrete, 1 inch tile covers where used with ceramic tile, and otherwise as appropriate for construction.

C. Exposed boxes shall be 4 inch square utility boxes.

D. Exterior boxes and boxes in wet location shall be cast aluminum or galvanized cast iron with appropriate gaskets and fittings.

E. Special purpose outlets shall have box types as required and/or as indicated on the drawings.

#### **PART 2 - PRODUCTS**

##### **2.01. MANUFACTURERS**

Outlet boxes shall be as manufactured by Appleton, Raco, Steel City or equal.

#### **PART 3 - EXECUTION**

##### **3.01. LOCATIONS**

Outlet locations shown on the drawings are approximate unless a dimensioned location is specified. Obtain Contracting Officer or official designated representative's approval before relocating any outlet due to conflicts.

##### **3.02. OCCURRING TOGETHER**

Where outlets at different levels occur together they shall be installed in one vertical line where possible. Where outlets occurring at the same height are shown they shall be mounted 6 to 10 inches apart unless specifically shown under a common cover.

##### **3.03. HEIGHTS**

Outlet heights in masonry walls may be slightly adjusted up or down to suit the masonry courses provided that a uniform height is maintained throughout the facility. Other mounting heights shall be as noted in the symbols legend and elsewhere in the drawings.

### **3.04. SWITCHES**

Switch outlets are generally to be located 6 to 10 inches from the door jamb on the latch side of the door where possible. Coordinate height as directed by Architect.

### **3.05. IN CASEWORK**

Where outlets occur in or above casework, counters, cabinets and other equipment their exact location and mounting height shall be verified with the particular item prior to roughing in.

**END OF SECTION**

## SECTION 16200

### CONDUCTORS

#### PART 1 - GENERAL

##### 1.01. WIRING METHODS

The wiring system shall consist of single conductor cables installed in metallic raceway unless noted otherwise on the drawings. Conductors shall be of the types and sizes shown and as specified herein; where no types or sizes are indicated they shall be as required by Code. Multi-conductor circuits shall be employed as indicated; assure that not more than one conductor is connected to the same phase to prevent overloading of the neutral conductor. Circuit numbers indicated by the home runs on the drawings are basically for circuit separation; circuits shall be connected to the panelboard to give an evenly balanced load between phases based on normal usage conditions of the connected equipment. Any departure from the circuiting arrangement shown on the drawings shall be approved in writing.

##### 1.02. COLOR CODING

Conductor color coding shall be in compliance with NEC Section 210-5. Where it is not practical to use color coded insulation, conductors shall be identified with a minimum 6 inch band of the proper colors of tape or paint in all panelboards, switches, junction boxes, pull boxes or other enclosures. All equipment grounding conductors shall be green. Conductors shall be color coded as follows:

#### 208Y/120 VOLT SYSTEMS

Phase A ----- Black  
Phase B ----- Red  
Phase C ----- Blue  
Neutral ----- White  
Ground ----- Green

#### PART 2 - PRODUCTS

##### 2.01. MATERIAL

Conductors shall be copper, not less than 98% conductivity, with 600 volt insulation. Manufacturer's name, insulation type and conductors size shall be imprinted on the outer jacket at regular intervals. Branch circuit conductors no. 10 and smaller shall be solid, type THWN; no. 8 and larger shall be stranded, type THW. Feeder conductors shall be type RHW or RHH.

##### 2.02. SIZES

All conductor sizes refer to AWG standard. Minimum wire size used in line voltage power circuits shall be no. 12. Minimum wire size used in control wiring circuits shall be no. 14 AWG.

##### 2.03. CONNECTORS

Splices in conductors shall be joined using solderless type connectors. For solid conductors, pre-insulated twist-on type connectors such as Ideal "Wing Nut" or Buchanan "B-Cap" shall be used. For stranded conductors, hydraulic or mechanical type compression connectors shall be used and the joint shall be wrapped with approved gum and friction tapes or electrical tape to equal the conductor insulation value.

## **2.04. MANUFACTURERS**

Conductors shall be of the types indicated manufactured by General, Okonite, Rome or Triangle.

## **PART 3 - EXECUTION**

### **3.01. INSTALLATION**

Do not install conductors until all conduit systems are complete and the building has been closed to the weather. Use only UL approved lubricants to facilitate the pulling of conductors.

### **3.02. SIZES**

Where the first device in a branch circuit occurs farther than 100 ft. from the panelboard the branch circuit conductors shall be increased to the next larger size.

**END OF SECTION**

**SECTION 16300**

**WIRING DEVICES**

**PART 1 - GENERAL**

**1.01. GENERAL**

All wiring devices shall be specification grade with features as described herein. See the symbols legend on the drawings for further descriptions of various devices. All wiring devices shall be gray in color and are to have plaster ears.

**PART 2 - PRODUCTS**

**2.01. DEVICE PLATES**

A. Flush mounted outlets : Device plates for all flush mounted outlets shall be one-piece type 302 stainless steel, .040 inches thick, satin finished with rounded edges. Plates shall be provided with the appropriate number of matching countersunk screws and shall be installed with all four edges in continuous contact with the finished wall.

B. Surface mounted outlets: Device plates for all surface mounted outlets shall be one-piece, zinc coated sheet steel, .040 inches thick with rounded edges and furnished with matching countersunk screws.

C. Exterior outlets: Device cover plates for exterior mounted outlets (or outlets mounted in wet locations) shall be cast aluminum or galvanized cast iron to match box construction and shall be installed with proper gasketing. Caps shall be permanently attached to the cover by means of a spring-loaded hinge.

D. Flush floor outlets: Plates for duplex receptacles mounted flush in the floor shall be brass with two hinged flaps and screwdriver operated flap latches.

**2.02. WALL SWITCHES**

A. General: Wall switches shall be the totally enclosed type with a non-conductive phenolic or plastic handle and deep slotted screw terminals. Switches shall be of a type such that only one switch may be installed in a single gang location. Switches shall be quiet-type, rated for 20 amps, 120/277 volts AC only with the throw, contact type, and number of poles as indicated.

B. Manufacturer's Catalog Numbers:

	Arrow-Hart	Bryant	Hubbell
Single Pole	1991	4901	1221
Double Pole	1992	4902	1222
Three Way	1993	4903	1223
Four Way	1994	4904	1224

C. Motor Switches: Motor switches shall be provided with pilot light and integral thermal overload protection. Enclosures shall be NEMA Type 1 or Type 4 as required by unit location. Units shall be

flush or surface mounted as indicated. Motor switches shall be Square D Class 2510 or equal with number of poles as required.

### 2.03. POWER RECEPTACLES

A. General: Power receptacles shall be of a standard NEMA configuration for the voltage and amperage characteristics of its intended use. Bodies shall be of a non-conductive phenolic or plastic compound or nylon permanently attached to a metal mounting yoke. Internal contact arrangement shall be such that contact is made on two opposite sides of an inserted blade. Ground terminals shall be connected to the mounting yoke and provided with a green colored screw for connection of the circuit grounding conductor. Ground fault circuit interrupter devices shall conform to the requirements of UL 943. Locking of receptacles indicated to be the locking type shall be accomplished by rotation of the plug.

#### B. Manufacturer's Catalog Numbers

	Arrow-Hart	Bryant	Hubbell
<u>20A, 125V devices - NEMA 5-20R</u>			
Single Outlet	5361	53261	
Duplex Outlet	5362	5362	
Duplex w/GFCI	GF8300	GFR53FT	

## PART 3 - EXECUTION

### 3.01. INSTALLATION

Power receptacle outlets shall be installed flush or surface mounted at the heights and locations shown on the drawings. Receptacles with ground terminals shall be installed with the ground terminal down. Care shall be exercised to protect the installed devices from paint splatter. Devices that have been damaged and/or devices that have been painted over shall be replaced prior to final inspection.

**END OF SECTION**

## **SECTION 16450**

### **GROUNDING SYSTEM**

#### **PART 1 - GENERAL**

Except where specifically indicated otherwise, all exposed non-current carrying metal parts of electric equipment, metallic raceway systems, equipment ground bus, metallic cable armor, grounding conductor in non-metallic raceways and the neutral conductor shall be grounded in accordance with NEC article 250. Bonding of the ground to the power wiring neutral conductor shall occur at the point of service entrance only. Ground shall be obtained by connecting the ground conductor to the water service by an approved type clamp; supplemental grounds shall be obtained by bonding to building steel and with driven rods.

#### **PART 2 - PRODUCTS**

2.01. GROUND RODS : Ground rods shall be copper-clad steel not less than 5/8 inch in diameter, 10 feet long, driven full length into the earth. Multiple ground rods shall be installed on not less than 8 foot centers or as shown.

2.02. BARE GROUND CONDUCTOR : Bare conductors for buried grounding system use shall be braided copper, no. 1 AWG minimum.

2.03. BUILDING EQUIPMENT GROUND CONDUCTOR : The equipment ground conductor shall be copper with green insulation. Where green insulation is not available, a minimum 6 inch band of green tape shall be applied at each termination point and in each cabinet, pullbox, etc. the conductor passes through.

#### **PART 3 - EXECUTION**

3.01. INSTALLATION : A ground conductor shall be installed in all plastic conduits, around expansion joints, in flexible conduits and as otherwise indicated on the drawings. The ground conductor shall be sized in accordance with Table 250.94 of the NEC.

3.02. CONNECTIONS : All connections to ground rods and underground grounding cable shall be made with hydraulic compression fittings or exothermic welds.

**END OF SECTION**

## **SECTION 16500**

### **PANELBOARDS**

#### **PART 1 - SCOPE**

##### **1.01. GENERAL**

Panelboards are existing. The Contractor shall provide and install all new circuits and breakers into existing panelboards as required by electrical work shown on the drawings.

##### **1.02. IDENTIFICATION**

Any unidentified panelboards shall be provided with engraved nameplates designating the panel name and voltage characteristics. See Section 16000 par. 1.08 for nameplate requirements.

#### **PART 2 - PRODUCTS**

##### **2.01. CONSTRUCTION**

All panelboards shall be deadfront construction, surface or recessed mounted. Lighting and appliance panelboards shall have a hinged door cover with a flush combination latch and keyed lock; all locks shall be keyed alike. All covers shall be finished with a factory applied, standard gray enamel. Backboxes shall be constructed of galvanized sheet steel and be a minimum of 20 inches wide.

##### **2.02. INTERIOR**

Circuit numbering shown on drawings is for circuit separation only; actual circuit numbers shall be determined in the field and noted on as-built drawings. Multi-pole circuit breakers shall have a common internal trip action and shall be inter-changeable with single-pole breakers. Where 'bussed space' is indicated, include all necessary provisions for adding additional breakers; no additional parts or modifications to the bussing or panel structure shall be required.

##### **2.03. MANUFACTURERS**

All components installed in existing panelboards shall be of the same type and style as recommended by the panelboard manufacturer. No components shall be installed that would violate UL listings or NEC requirements.

#### **PART 3 - EXECUTION**

##### **3.01. DURING CONSTRUCTION**

Protect panels with temporary protective covers when other work in the immediate area which is potentially damaging to them is completed (especially plastering and masonry operations around flush mounted panels).

**END OF SECTION**

**SECTION 16550**  
**SAFETY SWITCHES**

**PART 1 - SCOPE**

**1.01. SAFETY SWITCHES**

Safety disconnect switches shall be provided for all motors and other equipment as indicated on the drawings or as required by code.

**1.02. WIRING TROUGHS AND GUTTERS**

Provide and install wiring gutters of the sizes and types shown on the drawings.

**PART 2 - PRODUCTS**

**2.01. CONSTRUCTION**

A. Safety Switches : Switches shall be heavy duty type, quick-make, quick-break in NEMA 1 general purpose enclosures with interlocking doors. Where exposed to the weather, moisture or where so noted, furnish switches in NEMA 3R enclosures. Switches used in motor circuits shall be horsepower rated.

B. Gutters : Wiring gutters shall be constructed of code gauge galvanized steel and painted to match the panelboards and safety switches. Covers shall be screw fastened or hinged and secured by screws. Where gutters are mounted exposed to weather or wet conditions they shall be NEMA 3R construction.

**2.02. MANUFACTURERS**

Safety switches shall be type HD by General Electric, Square D or Siemens. Gutters shall be manufactured by Square D, B & C or General Switch.

**PART 3 - EXECUTION**

Safety switches and wiring gutters shall be installed in accordance with the NEC and applicable local codes. Observe working clearance requirements when mounting switches. Where fusible switches are indicated or required they shall be equipped with rejection type fuse clips, furnish complete with fuses.

**END OF SECTION**

## **SECTION 16570**

### **FUSES**

#### **PART 1 - SCOPE**

##### **1.01. GENERAL**

Provide a complete set of fuses for each fusible switch of the proper size and voltage rating required. All fuses installed shall be new and a product of the same manufacturer. Fuses installed in 120/208 or 120/240 volt systems shall be rated for 250VAC minimum; fuses installed in 277/480 volt systems shall be rated for 600VAC.

#### **PART 2 - PRODUCTS**

##### **2.01. GENERAL PURPOSE FUSES**

General purpose fuses shall be used for heating, lighting and other non-motor loads where heavy start-up currents are not encountered. General purpose fuses shall be Class H, K5 or RK5.

##### **2.02. TIME DELAY FUSES**

Time delay fuses shall utilize a dual-element design to allow sustained heavy start-up currents, such as for motors, without blowing the fuse. Time delay fuses shall be Class J, RK1, or RK5.

##### **2.03. FAST ACTING FUSES**

Fast acting fuses shall be used for feeder protection, circuit breaker back-up or increased equipment protection. These fuses shall be listed as current-limiting and shall be Class J, RK1, L or T.

##### **2.04. MANUFACTURERS**

Fuses shall be manufactured by Bussman, General Electric or Gould-Shawmut.

#### **PART 3 - EXECUTION**

##### **3.01. INSTALLATION**

Coordinate fuse sizes and types with the fuse holders of the individual switches, starters, etc. Fuse ampacities shall be coordinated with the manufacturer of the actual equipment being installed. Provide one set of spare fuses of each type and ampacity.

##### **3.02. COORDINATION**

The use of fuses in any part of the power distribution system shall be coordinated with the panelboards, switchboards and circuit breakers selected for use.

**END OF SECTION**

## **SECTION 16600**

### **LIGHTING SYSTEM**

#### **PART 1 - SCOPE**

##### **PART 1 - GENERAL**

The contractor shall furnish and install all lighting fixtures and lamps as indicated in the Lighting Fixture Schedule and as shown on the plans. See Section 16000, paragraph 1.06 for fixture substitution requirements.

##### **PART 2 - PRODUCTS**

###### **2.01. LAMPS**

All lamps shall be new. Incandescent lamps shall be 130V extended service lamps. Fluorescent lamps shall be the energy saving type, 3500°K color temperature unless otherwise indicated. H.I.D. lamps shall be of the size and type recommended by the fixture manufacturer for use in a particular fixture.

###### **2.02. BALLASTS**

All ballasts shall be UL labeled and shall contain no P.C.B.s. Fluorescent ballasts shall be the electronic energy saving type and shall have a sound classification of "A". Low temperature ballasts for starting down to 0 degrees F. shall be furnished in all unconditioned spaces and where so indicated.

###### **2.03. LOW-VOLTAGE RELAYS**

Relays used for low-voltage lighting control shall be dual-coil, mechanical latching type for use with 24 volts DC or rectified AC. Operation shall be by a momentarily applied pulse to the coil (50 msec. min.); coils shall be burnout resistant. Line voltage terminations shall be screw-actuated clamp type. Relays shall be designed for mounting in a standard 1/2" knockout and shall operate properly in any position. Contacts shall be rated for 20 amps tungsten filament or ballast loads.

###### **2.03. MANUFACTURERS**

All lamps shall be of the size and type indicated and shall be manufactured by General Electric, Osram-Sylvania or Philips. Ballasts shall be manufactured by Advance, Magnetek or Universal. Low-voltage relays shall be General Electric type RR 7 or equivalent.

#### **PART 3 - EXECUTION**

All fixtures shall be furnished with necessary backboxes, frames, hangers and other hardware required for a complete installation. Coordinate recessed fixture clearances with the air conditioning trade to avoid conflicts with duct work. Prior to final inspection, all fixtures shall be lamped and cleaned with a soft cloth or sponge and a mild detergent (not soap) solution.

**END OF SECTION**

# FIRE ALARM SYSTEM

## SECTION 16800

### PART 1 - SCOPE

#### 1.01. GENERAL :

The contractor shall furnish and install a complete and operating fire detection and alarm system as shown on the drawings and as specified herein. The system shall be fully tested after installation is complete and left in first class operating condition. The system shall conform to all requirements of applicable NFPA requirements and local codes and authorities having jurisdiction.

#### 1.02. SEQUENCE OF OPERATION :

The fire alarm system shall continually monitor all initiating devices connected to it. All initiating and annunciating circuits shall be electrically supervised to detect shorts, ground faults and open circuits and shall sound a 'trouble' signal if any of these conditions are detected.

In the event of an alarm signal being received all audible and visual signals shall be activated, air handling units shall shut down and the system shall initiate a notification signal to the monitoring station. An alarm silence switch on the main control panel shall silence the audible alarms while visual alarms continue to operate; should a second alarm signal be received after the audible alarms have been silenced they shall automatically resound. A system alarm condition shall be cleared only by a reset switch at the main control panel.

#### 1.03. MANUFACTURERS :

Descriptions were written based on Gamewell equipment. Equal products by Gamewell, Edwards or Simplex will be considered for approval subject to meeting all specification requirements.

### PART 2 - PRODUCTS

#### 2.01. CONTROL PANEL

The fire alarm system control panel shall be a 24 volt DC system complete with power supply, standby batteries and charger, electronic system motherboard, provisions for plug-in option cards, terminal strips for incoming wiring and systems status LEDs. The panel shall provide for control of 4 class B initiating zones. The standby batteries shall be capable of powering the system for 24 hours in the supervisory mode followed by 10 minutes in the alarm mode.

#### 2.02. SMOKE DETECTORS

##### 2.02.1. Ionization Type

Ionization type smoke detectors shall be ceiling mounted on a detachable base. The detectors shall be dual chamber type and shall have an alarm indicating light and 1 set of SPDT contacts.

##### 2.02.2. Photoelectric Type

Photoelectric type smoke detectors shall be ceiling mounted on a detachable base. Detector sensitivity shall be 3.0%/ft. nominal. Each detector shall have an alarm indicating light and 1 set of SPDT contacts.

##### 2.02.3. Duct Mounted

Duct-mounted smoke detectors shall be ionization type mounted in a special enclosure fitted with duct sampling tubes which shall run the full width of the duct. The entire assembly shall conform to the requirements of NFPA 90A and shall be UL listed specifically for use in air handling systems. Each duct detector shall be furnished with a test station to be local or remote mounted as shown. The test station shall contain an alarm indicating light and a keyed test and reset switch.

### **2.03. HEAT DETECTORS**

Combination type heat detectors shall have a fixed temperature element designed to operate at 135 degrees F. and a pneumatic rate of rise element designed to detect temperature changes greater than 15 degrees F./min. Detectors shall be suitable for ceiling mounting on a standard outlet box.

### **2.04. MANUAL STATIONS**

Manual pull stations shall be the non-coded type. Stations located outdoors or in wet locations shall be approved for such use. Stations shall be single-action, break glass type with contacts rated for 3 amps, 125 volts AC. The housing shall be cast or extruded aluminum painted red with the word 'FIRE' plainly visible. Manual pull stations shall be mounted 48" AFF.

### **2.05. ALARM INDICATING DEVICES**

#### **2.05.1. Horns**

Alarm horns shall be flush mounted at 7'-0" AFF with red protective metal cover plates. The horns shall be the heavy duty type with a minimum output level of 90dB at 10 feet.

#### **2.05.2. Flashing Lights**

Flashing light assemblies shall be mounted at 7'-0" AFF. They shall have a high impact plastic lens with the word 'FIRE' printed to be readable from any angle. The signal shall be non-coded with a minimum flash rate of 120 flashes/ min. The light source shall be a high-intensity Xenon flash tube.

#### **2.05.3. Combination Devices**

Combination horn/flashing light assemblies shall meet all requirements listed above for individual horn and light units.

### **2.06. REMOTE ANNUNCIATOR PANEL**

The remote annunciator panel shall be a backlighted type with an alpha-numeric display of the status of the system including tamper and trouble indicator. The trouble indicator shall include an audible signal with a silencing switch and automatic resound feature. The unit shall contain a terminal strip for connection for incoming wiring.

## **PART 3 - EXECUTION**

### **3.01. INSTALLATION**

The fire alarm system shall be installed in accordance with NFPA 70 (NEC), and NFPA 72 as applicable. All wiring shall be color coded, terminated on terminal strips and installed in conduit. Minimum conductor size shall be #14 AWG; stranded conductors shall be used. Locations of equipment shall be as shown on plans. The contractor shall leave the system fully tested and in first class operating condition. Before final acceptance, the contractor shall furnish a letter of certification from the manufacturer's representative stating that the system has been installed in accordance with the manufacturer's accepted procedures and has been thoroughly tested and shown to be fully operational.

**End of Section**