



# **100% Construction Documents SUBMITTAL**

## **SPECIFICATIONS Volume 1**

### **Renovate P-Side for Super Pod Phase 2 Building 160**

Project Number: 621-15-120

James H. Quillen VA Medical Center  
Mountain Home, TN

December 21, 2015

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Planning, Design, Construction  
and Related Services





Professional Seals / Certifications

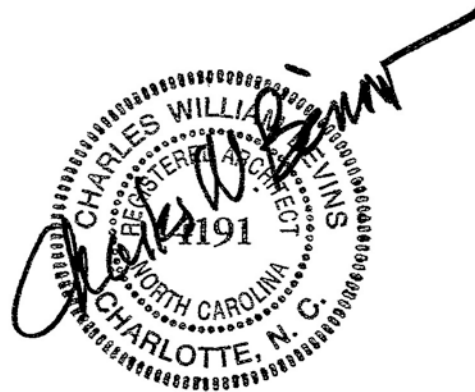
Construction Documents Submission

December 21, 2015

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12/21/15

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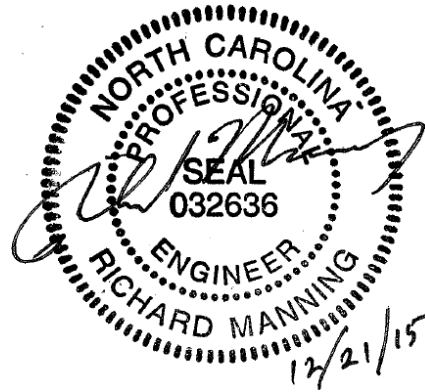
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**DEPARTMENT OF VETERANS AFFAIRS  
VHA MASTER SPECIFICATIONS**

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The drawings listed below accompanying this specification form a part of the contract.

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GI003	Abbreviations
GI004	UL Designs: UL #U411
GI005	UL Designs: UL #d916
GI006	UL Designs: UL #U465
GI007	UL Designs: UL #438
GI008	UL Designs: UL #HW-D-0060
GI009	UL Designs: UL #HW-D-0119
GI101	Life Safety Plan - Level 4
GI102	Architectural Third Floor Phase 1 Demolition Plan
GI103	Architectural Third Floor Phase 1 Floor Plan
GI104	Architectural Third Floor Phase 1A Transition Plan
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AE103	Architectural Floor Plan: Third Floor P-Side Partial Plan

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PL102	Plumbing Third Floor Phasing Plan: Waste/Vent - Phase 2
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MD401_2	Enlarged Mechanical Room N400 Phase 2 Plan Demolition
MD402	Enlarged Mechanical Room N500 Plan Demolition
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MH101_2	Mechanical Third Floor Phase 2 Plan New Ductwork
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**SECTION 01 00 00  
GENERAL REQUIREMENTS**

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**SECTION 01 00 00**  
**GENERAL REQUIREMENTS**

**1.1 GENERAL INTENTION**

- A. Subject to the conditions imposed by the James H. Quillen VAMC, James H. Quillen, TN 37684 Contracting Officer, Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform work for Renovate P-Side for Super Pod Phase 2 Building 160, Project: 621-15-120 as required by drawings and specifications.
- B. Visits to the site by Bidders may be made only by appointment with the James H. Quillen VAMC Contracting Officer.
- C. Offices of Atriax, PLLC, 102 Third Ave. NE, Hickory, NC 28601, as Architect-Engineers, will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.
- D. Contracting Officer's Representative Paragraph deleted.
- E. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA police, be identified by project and employer, and restricted from unauthorized access.
- F. Prior to commencing work, general contractor shall provide proof that a OSHA designated "competent person" (CP) (29 CFR 1926.20(b)(2)) will maintain a presence at the work site whenever the general or subcontractors are present.
- G. Training:
  - 1. All employees of general contractor or subcontractors shall have the 10-hour or 30-hour OSHA Construction Safety course and other relevant competency training, as determined by COR acting as the Construction Safety Officer with input from the facility Construction Safety Committee.

2. Submit training records of all such employees for approval before the start of work.

H. VHA Directive 2011-36, Safety and Health during Construction, dated 9/22/2011 in its entirety is made a part of this section

## 1.2 STATEMENT OF BID ITEM(S)

A. **BASE BID ITEM I**, Renovate P-Side for Super Pod Phase 2 Building 160, Project: 621-15-120: Work includes general construction, alterations, mechanical and electrical work, equipment, utility systems and necessary removal of existing structures and construction and certain other items as shown on the contract documents to renovate approximately 23,350 sf of existing space on the 4<sup>th</sup> floor of Building 160. The renovation will convert the existing space into outpatient mental health clinical exam rooms, group testing rooms, medical staff support spaces, administrative staff spaces, conference and lounge areas, waiting and reception areas, multipurpose and classroom spaces, restrooms, and corridor/circulation areas. The construction time allocated for completion of the work is **360 calendar days from notice to proceed** by the VA. Award is subject to the availability of funds.

**BID ITEM 1 IS THE COST FOR THE COMPLETE PROJECT AS DESCRIBED IN PARAGRAPH A.**

## B. BID DEDUCTS

The items below are all deducts to the Base Bid listed in priority order. Bid Deducts are graphically indicated on GI101 Deducts listed below are to be broken out separately on the bid form.

### 1. ALTERNATE BID ITEM 2

**Deduct:** Delete all costs for equipment, materials, labor, supervision, and quality control associated with the installation of new doors/hardware to the existing patio areas. Doors to be deleted are P4C6, P4C6A, P4C16, P4C16A, P4C21 and P4C21A. Existing doors to be inspected for damage, repaired as necessary (including glazing), and cleaned for operation.

If selected, the construction time allocated for completion of the work associated with Alternate Bid Item 2 is **360 calendar days from the notice to proceed** by the VA. Award is subject to the availability of funds.

ALTERNATE BID ITEM 2 IS THE CUMMULATIVE DEDUCT COST FOR THE COMPLETE PROJECT AS DESCRIBED IN BASE BID ITEM 1 LESS THE COSTS OF ALTERNATE BID ITEM 2 DESCRIBED ABOVE.

## **2. ALTERNATE BID ITEM 3**

**Deduct:** Delete all costs for equipment, materials, labor, supervision, and quality control for areas indicated on Alternate Bid Floor Plan as Alternate Bid Item 3. Deleted work associated with Alternate Bid Item 3 as identified shaded includes the following:

### **Architectural**

For all areas graphically identified as Bid Alternate #3:

1. All existing room walls, floors, and base shall remain as currently constructed.
2. The boundary walls on the corridor side shall be finished as depicted in the contract documents.
3. The boundary walls on the existing room side shall remain as constructed.
4. Existing ceilings shall remain as constructed except where new utilities run in the existing ceiling spaces. In this condition new ceiling pads will be required for the affected area. Coordinate need for new ceilings with the MEP drawings.

### **HVAC**

For all areas graphically identified as Bid Alternate #3:

1. Existing Terminal Units, Low Pressure Supply Ductwork and Supply Diffusers shall remain and be connected to new AHU Supply.
2. Existing Return Ductwork and Return Diffusers shall remain and connected to new AHU Supply.
3. Existing Exhaust Ductwork and Exhaust Diffusers shall remain and connected to New Exhaust Fan(s).
4. Existing Reheat Piping shall remain.

### **Plumbing**

For all areas graphically identified as Bid Alternate #3:

1. Existing plumbing fixtures to remain.
2. Existing plumbing piping above ceiling and below floor to remain.

3. Existing plumbing chases to remain as constructed.
4. Shutdown to existing water mains within this area will take place to connect new piping to serve new plumbing fixtures.

### **Electrical**

For all areas graphically identified as Bid Alternate #3:

1. Existing lighting and controls to remain in individual rooms. New adjacent corridor to access P4207 will have 6" downlights spaced ±8' on center and alternately connected to the new normal and life safety lighting circuits. Add one exit sign.
2. Existing receptacles and telecommunications devices to remain in individual rooms. Add one corridor receptacle and one video surveillance camera.

If selected, the construction time allocated for completion of the work associated with Alternate Bid Item 3 is **260 calendar days from notice to proceed** by the VA. Award is subject to the availability of funds

**ALTERNATE BID ITEM 3 IS THE CUMMULATIVE DEDUCT COST FOR THE COMPLETE PROJECT AS DESCRIBED IN BASE BID ITEM 1 LESS THE COSTS OF ALTERNATE BID ITEM 2, AND LESS ALTERNATE BID ITEM 3 AS DESCRIBED ABOVE.**

### **3. ALTERNATE BID ITEM 4**

**DEDUCT:** Delete all costs for equipment, materials, labor, supervision, and quality control associated with the following:

- a. Delete all Digital Vinyl Wall coverings from each room noted on the FINISH SCHEDULE in the section describing wall finishes on sheets IN601, IN602, IN603, IN604, IN605, IN606, and IN607. In lieu of Digital Vinyl Wall covering, walls are to be prepped and painted with the equivalent finish as the remaining walls in the areas. The paint color for these areas will be selected from the equivalent submitted and approved paint products for the project.

- b. Delete all Pre-Manufactured Stone Veneer panels in the Waiting General area, P4100 and as graphically depicted on sheet GI106. In lieu of Pre-Manufactured Stone Veneer panels, walls are to be prepped and painted with the equivalent finish as the remaining walls in the areas. The wall base is to match the base selected for the remaining walls in the Waiting General area. The paint color for these areas

will be selected from the equivalent submitted and approved paint products for the project.

c. Delete 4 total "3form panels/light boxes" located in the center of the decorative wall panel - 2 located on the north wall of Corridor 14, 1 located on the south wall of Corridor 8, and 1 located on the south wall of Corridor 2. Decorative wall panel is graphically detailed on sheet IN501 and verbally described in the WALLS section for each corridor on sheet IN606. The wall will be prepped and painted with the equivalent finish of the remaining decorative wall panel. The paint color for these areas will be selected from the equivalent submitted and approved paint products for the project.

d. Delete lighting fixture type S2 in its entirety and type D6W shown at 4 light box locations and associated branch circuit wiring.

If selected, the construction time allocated for completion of the work associated with Alternate Bid Item 4 is **260 calendar days from the notice to proceed** by the VA. Award is subject to the availability of funds.

**ALTERNATE BID ITEM 4 IS THE CUMMULATIVE DEDUCT COST FOR THE COMPLETE PROJECT AS DESCRIBED IN BASE BID ITEM 1 LESS THE COSTS OF ALTERNATE BID ITEM 2, LESS THE COSTS OF ALTERNATE BID ITEM 3, AND LESS THE COSTS OF ALTERNATE BID ITEM 4 AS DESCRIBED ABOVE.**

#### **4. ALTERNATE BID ITEM 5**

**DEDUCT:** Delete all costs for equipment, materials, labor, supervision, and quality control for areas indicated on Alternate Bid Floor Plan as Alternate Bid Item 5. Deleted work associated with Alternate Bid Item 4 as graphically identified includes the following:

#### **Architectural**

For all areas graphically identified as Bid Alternate #5:

1. All existing room walls, ceilings, floors, and base shall remain as currently constructed.
2. The boundary walls on the corridor side shall be finished as depicted in the contract documents.

3. The boundary walls on the existing room side shall remain as constructed.

**HVAC**

For all areas graphically identified as Bid Alternate #5:

1. Existing Terminal Units, Low Pressure Supply Ductwork and Supply Diffusers shall remain and be connected to new AHU Supply.
2. Existing Return Ductwork and Return Diffusers shall remain and connected to new AHU Supply.
3. Existing Exhaust Ductwork and Exhaust Diffusers shall remain and connected to New Exhaust Fan(s).
4. Existing Reheat Piping shall remain.

**Plumbing**

For all areas graphically identified as Bid Alternate #5:

1. Existing plumbing fixtures to remain.
2. Existing plumbing piping above ceiling and below floor to remain.
3. Existing plumbing chases to remain as constructed.

**Electrical**

For all areas graphically identified as Bid Alternate #5:

1. Existing lighting and controls to remain in individual rooms.
2. Existing receptacles and telecommunications devices to remain in individual rooms.
3. Delete new 30 KVA transformer, new panel L3D1, and associated feeders and circuit breaker.

If selected, the construction time allocated for completion of the work associated with Alternate Bid Item 5 is **200 calendar days from notice to proceed by the VA**. Award is subject to the availability of funds

**ALTERNATE BID ITEM 5 IS THE CUMMULATIVE DEDUCT COST FOR THE COMPLETE PROJECT AS DESCRIBED IN BASE BID ITEM 1 LESS THE COSTS OF ALTERNATE BID ITEM 2, LESS ALTERNATE BID ITEM 3, LESS ALTERNATE BID ITEM 4, AND LESS THE COSTS OF ALTERNATE BID ITEM 5 DESCRIBED ABOVE.**

**1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR**

- A. AFTER AWARD OF CONTRACT, one (1) set of specifications and drawings will be furnished, one (1) CD with .pdf files, and one CD with dwg files of drawings.
- B. Additional sets of drawings may be made by the Contractor, at Contractor's expense from the hard copy or the CD furnished.

**1.4 CONSTRUCTION SECURITY REQUIREMENTS****A. Security Plan:**

- 1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.
- 2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

**B. Security Procedures:**

- 1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
- 2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days' notice to the Contracting Officer's Representative (COR) so that security arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
- 3. No photography of VA premises is allowed without written permission of the Contracting Officer.
- 4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

**C. Guards: Not required.**

D. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the Contracting Officer's Representative (COR) for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.
2. The General Contractor shall turn over all permanent lock cylinders to the VA locksmith for permanent installation. See Section 08 71 00, DOOR HARDWARE and coordinate.

E. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".
2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
3. Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer upon request.
4. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.
5. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.
6. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".



7. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).
  - a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.
  - b. "Sensitive information" including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.

#### F. Motor Vehicle Restrictions

1. Permits shall be issued for General Contractor and its employees for parking in designated areas arranged for this project. Deliveries of materials/products for the project may be made at the rear loading dock but such deliveries must be coordinated with the Contracting Officer's Representative (COR).

### 1.5 FIRE SAFETY

- A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):

E84-2009.....Surface Burning Characteristics of Building  
Materials

2. National Fire Protection Association (NFPA):

10-2010.....Standard for Portable Fire Extinguishers

30-2008.....Flammable and Combustible Liquids Code

51B-2009.....Standard for Fire Prevention During Welding,  
Cutting and Other Hot Work

70-2011.....National Electrical Code

101-2012.....Life Safety Code

241-2009.....Standard for Safeguarding Construction,  
Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926.....Safety and Health Regulations for Construction

4. VHA Directive 2005-007

- B. Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Contracting Officer's Representative for review for compliance with VHA Directive 2005-007, NFPA 101 and NFPA 241. Prior to beginning work, all employees of the contractor and/or any subcontractors shall undergo a safety briefing provided by the general contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Provide documentation to the Contracting Officer's Representative that all construction workers have undergone contractor's safety briefing.
- C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- E. Temporary Construction Partitions:
1. Install and maintain temporary construction partitions to provide safe, smoke-tight separations between construction areas and adjoining areas where shown on contract drawings. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints

and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices. Public side of the temporary construction partition shall be finished to a level appropriate for painting. Contractor shall install a rubber base and paint the temporary construction partition to match adjacent areas.

2. Install temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration firestop materials in accordance with Section 07 84 00, FIRESTOPPING.

F. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

G. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Contracting Officer's Representative.

H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions to Contracting Officer's Representative weekly.

I. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

J. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

K. Paragraph deleted.

L. Paragraph deleted.

M. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch

for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Contracting Officer's Representative. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Contracting Officer's Representative.

- N. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Contracting Officer's Representative.
- O. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Contracting Officer's Representative. Obtain permits from Contracting Officer's Representative at least 24 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.
- P. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Contracting Officer's Representative.
- Q. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- R. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- S. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.
- T. If required, submit documentation to the Contracting Officer's Representative that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

**1.6 OPERATIONS AND STORAGE AREAS**

- A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.
- D. Working space and space available for storing materials shall be as determined by the Contracting Officer's Representative.
- E. Workmen are subject to rules of Medical Center.
- F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly

by patients or medical personnel, and Contractor's personnel, except as permitted by Contracting Officer's Representative where required by limited working space.

1. Do not store materials and equipment in other than assigned areas.

G. Utilities Services: Where necessary to cut existing pipes, electrical wires, conduits, cables, etc., of utility services, or of fire protection systems or communications systems (except telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by Contracting Officer's Representative. All such actions shall be coordinated with the Utility Company involved:

H. Building No. 160 will be occupied during performance of work; but immediate areas of alterations will be vacated.

1. All other areas of Building No. 160 will be occupied by Medical Center personnel.
2. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Medical Centers operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs personnel and patients through other construction areas which serve as routes of access to such affected areas and equipment. Coordinate alteration work in areas occupied by Department of Veterans Affairs so that Medical Center operations will continue during the construction period.

I. Paragraph I. deleted.

J. As each individual phase is turned over to Contractor, Contractor shall accept entire responsibility therefore.

1. Contractor shall maintain a minimum temperature of 4 degrees C (40 degrees F) at all times, except as otherwise specified.
2. Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, Contractor shall make arrangements for pre-inspection of

site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from Contractor's employee or watchman.

K. Utilities Services: Maintain existing utility services for Medical Center at all times. Provide temporary facilities, labor, materials, equipment, connections, and utilities to assure uninterrupted services. Where necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by Contracting Officer's Representative.

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of Contracting Officer's Representative. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Director's prior knowledge and written approval. Refer to specification Sections 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS, 27 05 11 REQUIREMENTS FOR COMMUNICATIONS INSTALLATIONS and 28 05 11, REQUIREMENTS FOR ELECTRONIC SAFETY AND SECURITY INSTALLATIONS for additional requirements.
2. Contractor shall submit a request to interrupt any such services to Contracting Officer's Representative, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.

4. Major interruptions of any system must be requested, in writing, at least 15 calendar days prior to the desired time and shall be performed as directed by the Contracting Officer's Representative.
5. In case of a contract construction emergency, service will be interrupted on approval of Contracting Officer's Representative. Such approval will be confirmed in writing as soon as practical.
- L. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are to be abandoned, are required to be entirely removed.
- M. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:
  1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.
- N. Coordinate the work for this contract with other construction operations as directed by Contracting Officer's Representative.
- O. Paragraph O. deleted.

#### **1.7 ALTERATIONS**

- A. Survey: Before any work is started, the Contractor shall make a thorough survey via video or photographic documentation with the Contracting Officer's Representative, of areas of Building 160 in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by both, to the Contracting Officer. This report shall list by rooms and spaces:
  1. Existing condition and types of resilient flooring, doors, windows, walls and other surfaces not required to be altered throughout affected areas of Building 160.
  2. Designated areas for working space, materials storage and routes of access to areas within buildings where alterations occur and which have been agreed upon by Contractor and Contracting Officer's Representative.
- B. Paragraph B. deleted.



C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and Contracting Officer's Representative together shall make a thorough re-survey of the areas of buildings involved. They shall furnish a report on conditions then existing, of resilient flooring, doors, windows, walls and other surfaces as compared with conditions of same as noted in first condition survey report:

1. Re-survey report shall also list any damage caused by Contractor to such flooring and other surfaces, despite protection measures; and, will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.

D. Protection: Provide the following protective measures:

1. Wherever existing roof surfaces are disturbed they shall be protected against water infiltration. In case of leaks, they shall be repaired immediately upon discovery.
2. Temporary protection against damage for portions of existing structures and grounds where work is to be done, materials handled and equipment moved and/or relocated.
3. Protection of interior of existing structures at all times, from damage, dust and weather inclemency. Wherever work is performed, floor surfaces that are to remain in place shall be adequately protected prior to starting work, and this protection shall be maintained intact until all work in the area is completed.

#### **1.8 INFECTION PREVENTION MEASURES**

A. Implement the requirements of the James H. Quillen VAMC's Infection Control Risk Assessment (ICRA) program. A copy of the project Construction/Renovation Risk Assessment Package will be provided by the ICRA manager at the pre-bid conference. The ICRA manager may monitor dust in the vicinity of the construction work and require the Contractor to take corrective action immediately if the safe levels are exceeded.

- B. Establish and maintain a dust control program as part of the contractor's infection preventive measures in accordance with the guidelines provided by ICRA manager. Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to the facility ICRA manager for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
  - 1. All personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.
- C. Medical center Infection Control personnel shall monitor for airborne disease (e.g. aspergillosis) as appropriate during construction. A baseline of conditions may be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality. In addition:
  - 1. The COR and VAMC Infection Control personnel shall review pressure differential monitoring documentation to verify that pressure differentials in the construction zone and in the patient-care rooms are appropriate for their settings. The requirement for negative air pressure in the construction zone shall depend on the location and type of activity. Upon notification, the contractor shall implement corrective measures to restore proper pressure differentials as needed.
  - 2. In case of any problem, the medical center, along with assistance from the contractor, shall conduct an environmental assessment to find and eliminate the source.
- D. In general, following preventive measures shall be adopted during construction to keep down dust and prevent mold.
  - 1. Dampen debris to keep down dust and provide temporary construction partitions in existing structures where directed by Contracting Officer's Representative. Blank off ducts and diffusers to prevent circulation of dust into occupied areas during construction.

2. Do not perform dust producing tasks within occupied areas without the approval of the Contracting Officer's Representative. For construction in any areas that will remain jointly occupied by the medical Center and Contractor's workers, the Contractor shall:
  - a. Provide dust proof barriers to completely separate construction from the operational areas of the hospital in order to contain dirt debris and dust. Barriers shall be sealed and made presentable on hospital occupied side. Maintain negative air at all times. A fire retardant polystyrene, 6-mil thick or greater plastic barrier meeting local fire codes may be used where dust control is the only hazard, and an agreement is reached with the Contracting Officer's Representative and Medical Center.
  - b. HEPA filtration is required where the exhaust dust may reenter the breathing zone. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. Install HEPA (High Efficiency Particulate Accumulator) filter vacuum system rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. Insure continuous negative air pressures occurring within the work area. HEPA filters should have ASHRAE 85 or other prefilter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Exhaust hoses shall be heavy duty, flexible steel reinforced and exhausted so that dust is not reintroduced to the medical center.
  - c. Adhesive Walk-off/Carpet Walk-off Mats, minimum 600mm x 900mm (24" x 36"), shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
  - d. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as they are created. Transport these outside the construction area in containers with tightly fitting lids.

- e. The contractor shall not haul debris through patient-care areas without prior approval of the Contracting Officer's Representative and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
  - f. Using a HEPA vacuum, clean inside the barrier and vacuum ceiling tile prior to replacement. Any ceiling access panels opened for investigation beyond sealed areas shall be sealed immediately when unattended.
  - g. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
  - h. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.
- E. Final Cleanup:
- 1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
  - 2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
  - 3. All new air ducts shall be cleaned prior to final inspection.

## **1.9 DISPOSAL AND RETENTION**

- A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:

1. Reserved items which are to remain property of the Government are identified by attached tags as items to be stored. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and reuse. Store such items where directed by Contracting Officer's Representative.
2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.
3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

**1.10 PARAGRAPH 1.10 IS DELETED.**

**1.11 RESTORATION**

- A. Subject to the conditions imposed by the Contracting Officer's Representative, remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the Contracting Officer's Representative. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the Contracting Officer's Representative before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.
- B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

- C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.
- D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

**1.12 PARAGRAPH 1.12 IS DELETED.**

**1.13 PARAGRAPH 1.13 IS DELETED.**

**1.14 LAYOUT OF WORK**

- A. The Contractor shall lay out the work from Government established base lines and bench marks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work.

**1.15 AS-BUILT DRAWINGS**

- A. The contractor shall maintain two full size sets of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.
- B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the Contracting Officer's Representative's review, as often as requested.
- C. Contractor shall deliver two approved completed sets of as-built drawings to the Contracting Officer's Representative within 15 calendar days after the final inspection of the project by the Contracting Officer's Representative.
- D. Paragraphs A, B, & C shall also apply to all shop drawings.

**1.16 USE OF ROADWAYS**

- A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the Contracting Officer's Representative, such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.

**1.17 PARAGRAPH 1.17 IS DELETED.****1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT**

- A. Use of new installed mechanical and electrical equipment to provide heat, ventilation, plumbing, light and power will be permitted subject to compliance with the following provisions:
1. Permission to use each unit or system must be given by Contracting Officer's Representative. If the equipment is not installed and maintained in accordance with the following provisions, the Contracting Officer's Representative will withdraw permission for use of the equipment.
  2. Electrical installations used by the equipment shall be completed in accordance with the drawings and specifications to prevent damage to the equipment and the electrical systems, i.e. transformers, relays, circuit breakers, fuses, conductors, motor controllers and their overload elements shall be properly sized, coordinated and adjusted. Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.
  3. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.
  4. Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze-up damage.

5. 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.

6. Deleted

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 the Government.

C. This paragraph shall not reduce the requirements of the mechanical and electrical specifications sections.

#### **1.19 TEMPORARY USE OF EXISTING ELEVATORS**

A'. Use of existing elevators for handling building materials and Contractor's personnel will be permitted subject to following provisions:

1. Contractor makes all arrangements with the Contracting Officer's Representative for use of elevators. The Contracting Officer's Representative will ascertain that elevators are in proper condition. Contractor may use elevators in Building 160 for daily use between the hours of 0600 - 0800 and 1700 - 1800 and for special nonrecurring time intervals when permission is granted. Personnel for operating elevators will not be provided by the Department of Veterans Affairs.

2. Contractor covers and provides maximum protection of following elevator components:

- a. Entrance jambs, heads soffits and threshold plates.
- b. Entrance columns, canopy, return panels and inside surfaces of car enclosure walls.
- c. Finish flooring.

#### **1.20 TEMPORARY USE OF NEW ELEVATORS (NOT APPLICABLE)**

#### **1.21 TEMPORARY TOILETS (NOT REQUIRED)**



**1.22 AVAILABILITY AND USE OF UTILITY SERVICES**

- A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.
- B. The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.
- C. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity as hereinafter specified.
- D. Heat: Furnish temporary heat necessary to prevent injury to work and materials through dampness and cold. Use of open salamanders or any temporary heating devices which may be fire hazards or may smoke and damage finished work, will not be permitted. Maintain minimum temperatures as specified for various materials:
  - 1. Obtain heat by connecting to Medical Center heating distribution system.
- E. Electricity (for Construction and Testing): Furnish all temporary electric services.
  - 1. Obtain electricity by connecting to the Medical Center electrical distribution system. The Contractor shall meter and pay for electricity required for electric cranes and hoisting devices, electrical welding devices and any electrical heating devices providing temporary heat. Electricity for all other uses is available at no cost to the Contractor.
- F. Water (for Construction and Testing): Furnish temporary water service.

1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.
  2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at Contracting Officer's Representative's discretion) of use of water from Medical Center's system.
- G. Steam: Furnish steam system for testing required in various sections of specifications.
1. Obtain steam for testing by connecting to the Medical Center steam distribution system. Steam is available at no cost to the Contractor.
  2. Maintain connections, pipe, fittings and fixtures and conserve steam-use so none is wasted. Failure to stop leakage or other waste will be cause for revocation (at Contracting Officer's Representative's discretion), of use of steam from the Medical Center's system.
- H. Fuel: Natural and LP gas and burner fuel oil required for boiler cleaning, normal initial boiler-burner setup and adjusting, and for performing the specified boiler tests will be furnished by the Government. Fuel required for prolonged boiler-burner setup, adjustments, or modifications due to improper design or operation of boiler, burner, or control devices shall be furnished by the Contractor at Contractor's expense.

#### **1.23 NEW TELEPHONE EQUIPMENT**

The contractor shall coordinate with the work of installation of telephone equipment by others. This work shall be completed before the building is turned over to VA.

#### **1.24 TESTS**

- A. Pre-test mechanical and electrical equipment and systems and make corrections required for proper operation of such systems before requesting final tests. Final test will not be conducted unless pre-tested.

- B. Conduct final tests required in various sections of specifications in presence of an authorized representative of the Contracting Officer. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests.
- C. Mechanical and electrical systems shall be balanced, controlled and coordinated. A system is defined as the entire complex which must be coordinated to work together during normal operation to produce results for which the system is designed. For example, air conditioning supply air is only one part of entire system which provides comfort conditions for a building. Other related components are return air, exhaust air, steam, chilled water, refrigerant, hot water, controls and electricity, etc. Another example of a complex which involves several components of different disciplines is a boiler installation. Efficient and acceptable boiler operation depends upon the coordination and proper operation of fuel, combustion air, controls, steam, feedwater, condensate and other related components.
- D. All related components as defined above shall be functioning when any system component is tested. Tests shall be completed within a reasonably short period of time during which operating and environmental conditions remain reasonably constant.
- E. Individual test result of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

#### **1.25 INSTRUCTIONS**

- A. Contractor shall furnish Maintenance and Operating manuals (hard copies and electronic) and verbal instructions when required by the various sections of the specifications and as hereinafter specified.
- B. Manuals: Maintenance and operating manuals and one compact disc (four hard copies and one electronic copy each) for each separate piece of equipment shall be delivered to the Contracting Officer's Representative coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment. They shall include complete information necessary for starting, adjusting, maintaining in continuous operation for long periods of time and dismantling and

reassembling of the complete units and sub-assembly components. Manuals shall include an index covering all component parts clearly cross-referenced to diagrams and illustrations. Illustrations shall include "exploded" views showing and identifying each separate item. Emphasis shall be placed on the use of special tools and instruments. The function of each piece of equipment, component, accessory and control shall be clearly and thoroughly explained. All necessary precautions for the operation of the equipment and the reason for each precaution shall be clearly set forth. Manuals must reference the exact model, style and size of the piece of equipment and system being furnished. Manuals referencing equipment similar to but of a different model, style, and size than that furnished will not be accepted.

- C. Instructions: Contractor shall provide qualified, factory-trained manufacturers' representatives to give detailed instructions to assigned Department of Veterans Affairs personnel in the operation and complete maintenance for each piece of equipment. All such training will be at the job site. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the Contracting Officer's Representative and shall be considered concluded only when the Contracting Officer's Representative is satisfied in regard to complete and thorough coverage. The Department of Veterans Affairs reserves the right to request the removal of, and substitution for, any instructor who, in the opinion of the Contracting Officer's Representative, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

**1.26 PARAGRAPH 1.26 IS DELETED.**

**1.27 RELOCATED EQUIPMENT AND ITEMS**

- A. Contractor shall disconnect, dismantle as necessary, remove and reinstall in new location, all existing equipment and items as indicated on the contract documents to be relocated by the Contractor.

- B. Perform relocation of such equipment or items at such times and in such a manner as directed by the Contracting Officer's Representative.
- C. Suitably cap existing service lines, such as steam, condensate return, water, drain, gas, air, vacuum and/or electrical, whenever such lines are disconnected from equipment to be relocated. Remove abandoned lines in finished areas and cap as specified herein before under paragraph "Abandoned Lines".
- D. Provide all mechanical and electrical service connections, fittings, fastenings and any other materials necessary for assembly and installation of relocated equipment; and leave such equipment in proper operating condition.

**1.28 PARAGRAPH 1.28 IS DELETED.**

**1.29 CONSTRUCTION SIGN - NOT REQUIRED**

**1.30 SAFETY SIGN - NOT REQUIRED**

**1.31 PHOTOGRAPHIC DOCUMENTATION - NOT REQUIRED.**

**1.32 FINAL ELEVATION DIGITAL IMAGES - NOT REQUIRED.**

**1.33 PARAGRAPH 1.33 IS DELETED.**

**1.34 PARAGRAPH 1.34 IS DELETED.**

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**SECTION 01 32 16.15**  
**PROJECT SCHEDULES**  
*(SMALL PROJECTS)*

**PART 1- GENERAL**

**1.1 DESCRIPTION:**

- A. The Contractor shall develop a Critical Path Method (CPM) plan and schedule demonstrating fulfillment of the contract requirements (Project Schedule), and shall keep the Project Schedule up-to-date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers). Conventional Critical Path Method (CPM) technique shall be utilized to satisfy both time and cost applications.

**1.2 CONTRACTOR'S REPRESENTATIVE:**

- A. The Contractor shall designate an authorized representative responsible for the Project Schedule including preparation, review and progress reporting with and to the Contracting Officer's Representative (COR).
- B. The Contractor's representative shall have direct project control and complete authority to act on behalf of the Contractor in fulfilling the requirements of this specification section.
- C. The Contractor's representative shall have the option of developing the project schedule within their organization or to engage the services of an outside consultant. If an outside scheduling consultant is utilized, Section 1.3 of this specification will apply.

**1.3 CONTRACTOR'S CONSULTANT:**

- A. The Contractor shall submit a qualification proposal to the COR, within 10 days of bid acceptance. The qualification proposal shall include:
1. The name and address of the proposed consultant.
  2. Information to show that the proposed consultant has the qualifications to meet the requirements specified in the preceding paragraph.
  3. A representative sample of prior construction projects, which the proposed consultant has performed complete project scheduling services. These representative samples shall be of similar size and scope.
- B. The Contracting Officer has the right to approve or disapprove the proposed consultant, and will notify the Contractor of the VA decision within seven calendar days from receipt of the qualification proposal. In case of disapproval, the Contractor shall resubmit another consultant within 10 calendar days for renewed consideration. The Contractor shall

have their scheduling consultant approved prior to submitting any schedule for approval.

#### **1.4 COMPUTER PRODUCED SCHEDULES**

- A. The contractor shall provide monthly, to the Department of Veterans Affairs (VA), all computer-produced time/cost schedules and reports generated from monthly project updates. This monthly computer service will include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of the scheduling software approved by the Contracting Officer; a hard copy listing of all project schedule changes, and associated data, made at the update and an electronic file of this data; and the resulting monthly updated schedule in PDM format. These must be submitted with and substantively support the contractor's monthly payment request and the signed look ahead report. The COTR shall identify the five different report formats that the contractor shall provide.
- B. The contractor shall be responsible for the correctness and timeliness of the computer-produced reports. The Contractor shall also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.
- C. The VA will report errors in computer-produced reports to the Contractor's representative within ten calendar days from receipt of reports. The Contractor shall reprocess the computer-produced reports and associated diskette(s), when requested by the Contracting Officer's representative, to correct errors which affect the payment and schedule for the project.

#### **1.5 THE COMPLETE PROJECT SCHEDULE SUBMITTAL**

- A. Within 45 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review; three blue line copies of the interim schedule on sheets of paper 30 x 42 inches and an electronic file in the previously approved CPM schedule program. The submittal shall also include three copies of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, activity/event description, duration, budget amount, early start date, early finish date, late start date, late finish date and total float. Work activity/event relationships shall be restricted to finish-to-start or start-to-start without lead or lag constraints. Activity/event date constraints, not required by the contract, will not be accepted unless submitted to and approved by the



Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer identifying these date constraints and secure the Contracting Officer's written approval before incorporating them into the network diagram. The Contracting Officer's separate approval of the Project Schedule shall not excuse the contractor of this requirement. Logic events (non-work) will be permitted where necessary to reflect proper logic among work events, but must have zero duration. The complete working schedule shall reflect the Contractor's approach to scheduling the complete project. The final Project Schedule in its original form shall contain no contract changes or delays which may have been incurred during the final network diagram development period and shall reflect the entire contract duration as defined in the bid documents. These changes/delays shall be entered at the first update after the final Project Schedule has been approved. The Contractor should provide their requests for time and supporting time extension analysis for contract time as a result of contract changes/delays, after this update, and in accordance with Article, ADJUSTMENT OF CONTRACT COMPLETION.

- D. Within 30 calendar days after receipt of the complete project interim Project Schedule and the complete final Project Schedule, the Contracting Officer or his representative, will do one or both of the following:
  - 1. Notify the Contractor concerning his actions, opinions, and objections.
  - 2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within 14 calendar days after the joint review, the Contractor shall revise and shall submit three blue line copies of the revised Project Schedule, three copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the Contracting Officer. The revised submission will be reviewed by the Contracting Officer and, if found to be as previously agreed upon, will be approved.
- E. The approved baseline schedule and the computer-produced schedule(s) generated there from shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this section.
- F. The Complete Project Schedule shall contain work activities/events.

#### **1.6 WORK ACTIVITY/EVENT COST DATA**

- A. The Contractor shall cost load all work activities/events except procurement activities. The cumulative amount of all cost loaded work

activities/events (including alternates) shall equal the total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the Contracting Officer to assist him in determining approval or disapproval of the cost loading. Negative work activity/event cost data will not be acceptable, except on VA issued contract changes.

- B. The Contractor shall cost load work activities/events for guarantee period services, test, balance and adjust various systems in accordance with the provisions in Article, FAR 52.232 - 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.236 - 83 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS).
- C. In accordance with FAR 52.236 - 1 (PERFORMANCE OF WORK BY THE CONTRACTOR) and VAAR 852.236 - 72 (PERFORMANCE OF WORK BY THE CONTRACTOR), the Contractor shall submit, simultaneously with the cost per work activity/event of the construction schedule required by this Section, a responsibility code for all activities/events of the project for which the Contractor's forces will perform the work.
- D. The Contractor shall cost load work activities/events for all BID ITEMS including ASBESTOS ABATEMENT. The sum of each BID ITEM work shall equal the value of the bid item in the Contractors' bid.

#### **1.7 PROJECT SCHEDULE REQUIREMENTS**

- A. Show on the project schedule the sequence of work activities/events required for complete performance of all items of work. The Contractor Shall:
  - 1. Show activities/events as:
    - a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.
    - b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.
    - c. Interruption of VA Facilities utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.
    - d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.

- e. VA inspection and acceptance activity/event with a minimum duration of five work days at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase.
- 2. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.
- 3. Break up the work into activities/events of a duration no longer than 20 work days each or one reporting period, except as to non-construction activities/events (i.e., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities/events for which the COTR may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals will not be less than 20 work days.
- 4. Describe work activities/events clearly, so the work is readily identifiable for assessment of completion. Activities/events labeled "start," "continue," or "completion," are not specific and will not be allowed. Lead and lag time activities will not be acceptable.
- 5. The schedule shall be generally numbered in such a way to reflect either discipline, phase or location of the work.
- B. The Contractor shall submit the following supporting data in addition to the project schedule:
  - 1. The appropriate project calendar including working days and holidays.
  - 2. The planned number of shifts per day.
  - 3. The number of hours per shift.

Failure of the Contractor to include this data shall delay the review of the submittal until the Contracting Officer is in receipt of the missing data.
- C. To the extent that the Project Schedule or any revised Project Schedule shows anything not jointly agreed upon, it shall not be deemed to have been approved by the COTR. Failure to include any element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the COTR's approval of the Project Schedule.
- D. Compact Disk Requirements and CPM Activity/Event Record Specifications: Submit to the VA an electronic file(s) containing one file of the data

required to produce a schedule, reflecting all the activities/events of the complete project schedule being submitted.

#### **1.8 PAYMENT TO THE CONTRACTOR:**

- A. Monthly, the contractor shall submit the AIA application and certificate for payment documents G702 & G703 reflecting updated schedule activities and cost data in accordance with the provisions of the following Article, PAYMENT AND PROGRESS REPORTING, as the basis upon which progress payments will be made pursuant to Article, FAR 52.232 - 5 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS) and VAAR 852.236 - 83 (PAYMENT UNDER FIXED-PRICE CONSTRUCTION CONTRACTS). The Contractor shall be entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated project schedule. Monthly payment requests shall include: a listing of all agreed upon project schedule changes and associated data; and an electronic file (s) of the resulting monthly updated schedule.
- B. Approval of the Contractor's monthly Application for Payment shall be contingent, among other factors, on the submittal of a satisfactory monthly update of the project schedule.

#### **1.9 PAYMENT AND PROGRESS REPORTING**

- A. Monthly schedule update meetings will be held on dates mutually agreed to by the COTR and the Contractor. Contractor and their CPM consultant (if applicable) shall attend all monthly schedule update meetings. The Contractor shall accurately update the Project Schedule and all other data required and provide this information to the COTR three work days in advance of the schedule update meeting. Job progress will be reviewed to verify:
  - 1. Actual start and/or finish dates for updated/completed activities/events.
  - 2. Remaining duration for each activity/event started, or scheduled to start, but not completed.
  - 3. Logic, time and cost data for change orders, and supplemental agreements that are to be incorporated into the Project Schedule.
  - 4. Changes in activity/event sequence and/or duration which have been made, pursuant to the provisions of following Article, ADJUSTMENT OF CONTRACT COMPLETION.
  - 5. Completion percentage for all completed and partially completed activities/events.
  - 6. Logic and duration revisions required by this section of the specifications.
  - 7. Activity/event duration and percent complete shall be updated independently.

- B. After completion of the joint review, the contractor shall generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer's representative with reports in accordance with the Article, COMPUTER PRODUCED SCHEDULES, specified.
- C. After completing the monthly schedule update, the contractor's representative or scheduling consultant shall rerun all current period contract change(s) against the prior approved monthly project schedule. The analysis shall only include original workday durations and schedule logic agreed upon by the contractor and COR for the contract change(s). When there is a disagreement on logic and/or durations, the Contractor shall use the schedule logic and/or durations provided and approved by the COR. After each rerun update, the resulting electronic project schedule data file shall be appropriately identified and submitted to the VA in accordance to the requirements listed in articles 1.4 and 1.7. This electronic submission is separate from the regular monthly project schedule update requirements and shall be submitted to the COR within fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final network diagram is approved, the contractor must recreate all manual progress payment updates on this approved network diagram and associated reruns for contract changes in each of these update periods as outlined above for regular update periods. This will require detailed record keeping for each of the manual progress payment updates.**
- D. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Consultant, RE office representatives, and all subcontractors needed, as determined by the SRE, shall meet to discuss the monthly updated schedule. The main emphasis shall be to address work activities to avoid slippage of project schedule and to identify any necessary actions required to maintain project schedule during the reporting period. The Government representatives and the Contractor should conclude the meeting with a clear understanding of those work and administrative actions necessary to maintain project schedule status during the reporting period. This schedule coordination meeting will occur after each monthly project schedule update meeting utilizing the resulting schedule reports from that schedule update. If the project is behind schedule, discussions should include ways to prevent further slippage as well as ways to improve the project schedule status, when appropriate.

**1.10 RESPONSIBILITY FOR COMPLETION**

- A. If it becomes apparent from the current revised monthly progress schedule that phasing or contract completion dates will not be met, the Contractor shall execute some or all of the following remedial actions:
  - 1. Increase construction manpower in such quantities and crafts as necessary to eliminate the backlog of work.
  - 2. Increase the number of working hours per shift, shifts per working day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the backlog of work.
  - 3. Reschedule the work in conformance with the specification requirements.
- B. Prior to proceeding with any of the above actions, the Contractor shall notify and obtain approval from the COTR for the proposed schedule changes. If such actions are approved, the representative schedule revisions shall be incorporated by the Contractor into the Project Schedule before the next update, at no additional cost to the Government.

**1.11 CHANGES TO THE SCHEDULE**

- A. Within 30 calendar days after VA acceptance and approval of any updated project schedule, the Contractor shall submit a revised electronic file (s) and a list of any activity/event changes including predecessors and successors for any of the following reasons:
  - 1. Delay in completion of any activity/event or group of activities/events, which may be involved with contract changes, strikes, unusual weather, and other delays will not relieve the Contractor from the requirements specified unless the conditions are shown on the CPM as the direct cause for delaying the project beyond the acceptable limits.
  - 2. Delays in submittals, or deliveries, or work stoppage are encountered which make rescheduling of the work necessary.
  - 3. The schedule does not represent the actual prosecution and progress of the project.
  - 4. When there is, or has been, a substantial revision to the activity/event costs regardless of the cause for these revisions.
- B. CPM revisions made under this paragraph which affect the previously approved computer-produced schedules for Government furnished equipment, vacating of areas by the VA Facility, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, shall be furnished in writing to the Contracting Officer for approval.

- C. Contracting Officer's approval for the revised project schedule and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.
- D. The cost of revisions to the project schedule resulting from contract changes will be included in the proposal for changes in work as specified in FAR 52.243 - 4 (Changes) and VAAR 852.236 - 88 (Changes - Supplemental), and will be based on the complexity of the revision or contract change, man hours expended in analyzing the change, and the total cost of the change.
- E. The cost of revisions to the Project Schedule not resulting from contract changes is the responsibility of the Contractor.

#### **1.12 ADJUSTMENT OF CONTRACT COMPLETION**

- A. The contract completion time will be adjusted only for causes specified in this contract. Request for an extension of the contract completion date by the Contractor shall be supported with a justification, CPM data and supporting evidence as the COTR may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in work days) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.
- B. Actual delays in activities/events which, according to the computer-produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path in the network, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.
- C. The Contractor shall submit each request for a change in the contract completion date to the Contracting Officer in accordance with the provisions specified under FAR 52.243 - 4 (Changes) and VAAR 852.236 - 88 (Changes - Supplemental). The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in work days) changes, and cost changes, for work in question

and its relationship to other activities on the approved network diagram.

- D. All delays due to non-work activities/events such as RFI's, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month by month basis.

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**SECTION 01 33 23**  
**SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES**

- 1-1. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.
- 1-2. For the purposes of this contract, samples, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.
- 1-3. Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:
  - A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
  - B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
  - C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.
- 1-4. Forward submittals in sufficient time to permit proper consideration and approval action by the VA. Time the submission to assure adequate lead time for procurement of contract-required items. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion.
- 1-5. Submittals will be reviewed for compliance with contract requirements by Architect-Engineer, and action thereon will be taken by Contracting Officers' Representative on behalf of the Contracting Officer.
- 1-6. Upon receipt of submittals, Architect-Engineer will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.
- 1-7. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment in contract price

and time will be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL CONDITIONS.

- 1-8. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and Architect-Engineer. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect-Engineer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.
- 1-9. Submittals must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.
  - A. Submit samples required by Section 09 06 00, SCHEDULE FOR FINISHES, in duplicate. Submit other samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in duplicate, except where a greater number is specified.
  - B. Submittals will receive consideration only when covered by a transmittal letter signed by Contractor. Letter shall be sent via first class mail or e-mail and shall contain the list of items, name of Medical Center, name of Contractor, contract number, applicable specification paragraph numbers, applicable drawing numbers (and other information required for exact identification of location for each item), manufacturer and brand, ASTM or Federal Specification Number (if any) and such additional information as may be required by specifications for particular item being furnished. In addition, catalogs shall be marked to indicate specific items submitted for approval.
    1. A copy of letter must be enclosed with items, and any items received without identification letter will be considered "unclaimed goods" and held for a limited time only.
    2. Each sample, certificate, manufacturers' literature and data shall be labeled to indicate the name and location of the Medical Center, name of Contractor, manufacturer, brand, contract number and ASTM or Federal Specification Number as applicable and location(s) on project.
    3. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.
  - C. Paragraph C. is deleted.

- D. If submittal samples have been disapproved, resubmit new samples as soon as possible after notification of disapproval. Such new samples shall be marked "Resubmitted Sample" in addition to containing other previously specified information required on label and in transmittal letter.
- E. Approved samples will be kept on file by the Contracting Officers' Representative at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.
- F. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.
  - 1. For each drawing required, submit one legible photographic paper or vellum reproducible.
  - 2. Reproducible shall be full size.
  - 3. Each drawing shall have marked thereon, proper descriptive title, including Medical Center location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
  - 4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
  - 5. Submit drawings, ROLLED WITHIN A MAILING TUBE, fully protected for shipment.
  - 6. One reproducible print of approved or disapproved shop drawings will be forwarded to Contractor.
  - 7. When work is directly related and involves more than one trade, shop drawings shall be submitted to Architect-Engineer under one cover.
- 1-10. Samples shall be submitted for approval to

Atriax, PLLC  
 102 Third Ave. NE  
 Hickory, NC 28601

**1-11. ELECTRONIC SUBMITTAL PROCEDURES****A. Summary:**

1. Basis of specification is Submittal Exchange website system for electronic construction submittals ([www.submittalexchange.com](http://www.submittalexchange.com)). The contractor may submit another provider however that provider must be deemed equal by the COR.
2. Substitution may be considered if submitted prior to bid date for pre-approval.
3. Shop drawing and product data submittals shall be transmitted to Architect and construction team members in electronic (PDF) format using Submittal Exchange ([www.submittalexchange.com](http://www.submittalexchange.com)) or other VA approved equal.
4. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.
5. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
6. Contractor to include the cost of using Submittal Exchange or other VA approved equal in their bid.

**B. Procedures:**

1. Follow submittal log in Submittal Exchange by inserting required submittals listed in individual specification sections.
2. Submittal Preparation - Contractor may use any or all of the following options:
  - a. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via the Submittal Exchange website.
  - b. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via email.
  - c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.
3. Printed Submittals: When requested by COR, provide two printed sets of submittals for shop drawings and structural framing in addition to electronic submittals.
4. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.
5. Contractor shall transmit each submittal to Architect using the Submittal Exchange website, [www.submittalexchange.com](http://www.submittalexchange.com).
6. Architect / Engineer review comments will be made available on the Submittal Exchange website for downloading. Contractor will receive email notice of completed review.
7. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.
8. Submit paper copies of any reviewed submittals not submitted electronically at project closeout for record purposes in accordance with Section 01 77 19 - Contract Closeout.

**C. Costs:**

1. General Contractor shall include the full cost of Submittal Exchange project subscription in their proposal. This cost is

included in the Contract Amount. Contact Submittal Exchange at 1-800-714-0024 x214 to verify cost prior to bid.

2. The intent is for Submittal Exchange service cost to be in lieu of postage or shipping costs typically paid for paper submittals. Service cost is a net cost savings to Contractor because submittals sent electronically do not need to be shipped physically.
3. After award of contract, training will be provided by Submittal Exchange regarding use of website and PDF submittals. Contact Submittal Exchange at 1-800-714-0024.
4. Internet Service and Equipment Requirements:
  - a. Email address and Internet access at Contractor's main office.
  - b. Adobe Acrobat ([www.adobe.com](http://www.adobe.com)), Bluebeam PDF Revu ([www.bluebeam.com](http://www.bluebeam.com)), or other similar PDF review software for applying electronic stamps and comments.

D. Products:

1. Basis of specification is Submittal Exchange website system for electronic construction submittals ([www.submittalexchange.com](http://www.submittalexchange.com)) or equal.
2. Substitution may be considered if submitted prior to bid date for pre-approval. Product requirements:
  - a. Independently hosted, web-based system for automated tracking, storage, and distribution of contract submittals, Requests For Information, and other contract related documents. FTP sites, e-mail exchanges, and server-based systems hosted from inside a contractor's office will not be considered are not acceptable.
  - b. Utilize 256-bit SSL encryption and hosted at SAS70 Type II compliant data centers.
  - c. Minimum five years documented experience of use on comparable commercial construction projects. "Comparable commercial construction projects" shall be defined as documented use on a minimum of five hundred governmental, public-entity, or private sector projects each of \$1 million construction value or greater.
  - d. Minimum five years documented 99.5% website uptime.
  - e. Unlimited individual user accounts and system access for all project subcontractors, general contractor, owner staff, architect, design consultants, and sub-consultants, with no additional fees for those parties to access the system.
  - f. Separate locations for owner, architect, design consultant, and sub-consultant review comments with contractors restricted from viewing comments until final review or release by owner or primary design consultant.
  - g. Full version histories and dates of exchanges automatically tracked and available for viewing, searching, and reporting in a linear log format compatible with AIA G712.
  - h. Functionality to group submittals as required packages and apply forms and review comments to entire package simultaneously.
  - i. Functionality for integrated online PDF viewing and review, including graphical markups and stamps, for owner, architect, design consultants, sub-consultants, and general contractor without need for additional software purchase.
  - j. Automatic, configurable email notifications for each project team member for new and reviewed submittals and other items.
  - k. Automatic, configurable email reminders of past due items.
  - l. Customized, automated PDF form generation for submittals, RFIs, and other documents matching standard templates used by owner, design consultants, sub-consultants, and general contractor. Documentation and demonstration of automatic form generation

- using each entity's templates must be submitted as part of any substitution request.
- m. Prior to project start, system vendor shall create submittal log with all required items from project manual or submittal register. Owner or primary design consultant shall have full control over required items list and access to edit, add, or remove items during project.
  - n. System vendor shall provide minimum one-hour live web meeting training sessions to contractors, design consultants, sub-consultants, and owners staff prior to project start.
  - o. System vendor shall make available minimum thirty-minute live web meeting training sessions for subcontractors at least twice weekly for the entire duration of the project.
  - p. System vendor shall provide access for owner, design consultants, sub-consultants, general contractor, and subcontractors to live technical support by phone and email minimum of 7 AM to 6 PM CST on standard business days at no additional cost.
  - q. Allowance for scanning and printing services provided by local third-party reprographic vendor to assist with obtaining documents electronically and online print ordering.
  - r. At completion of project closeout, system vendor shall provide minimum of four archival discs that include all documents and tracking logs, or the ability to download this information from the live website in a single complete archive package.

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**SECTION 01 35 26**  
**SAFETY REQUIREMENTS**

1.1 APPLICABLE PUBLICATIONS:

A. Latest publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society of Safety Engineers (ASSE):

A10.1-2011.....Pre-Project & Pre-Task Safety and Health  
Planning

A10.34-2012.....Protection of the Public on or Adjacent to  
Construction Sites

A10.38-2013.....Basic Elements of an Employer's Program to  
Provide a Safe and Healthful Work Environment  
American National Standard Construction and  
Demolition Operations

2. American Society for Testing and Materials (ASTM):

E84-2013.....Surface Burning Characteristics of Building  
Materials

3. The Facilities Guidelines Institute (FGI):

FGI Guidelines-2010Guidelines for Design and Construction of  
Healthcare Facilities

4. National Fire Protection Association (NFPA):

10-2013.....Standard for Portable Fire Extinguishers

30-2012.....Flammable and Combustible Liquids Code

51B-2014.....Standard for Fire Prevention During Welding,  
Cutting and Other Hot Work

70-2014.....National Electrical Code

70B-2013.....Recommended Practice for Electrical Equipment  
Maintenance

70E-2012 .....Standard for Electrical Safety in the Workplace

99-2012.....Health Care Facilities Code

241-2013.....Standard for Safeguarding Construction,  
Alteration, and Demolition Operations

5. The Joint Commission (TJC)

TJC Manual .....Comprehensive Accreditation and Certification  
Manual

6. U. S. Nuclear Regulatory Commission

10 CFR 20 .....Standards for Protection Against Radiation

7. U. S. Occupational Safety and Health Administration (OSHA):

29 CFR 1904 .....Reporting and Recording Injuries & Illnesses

29 CFR 1910 .....Safety and Health Regulations for General  
Industry

29 CFR 1926 .....Safety and Health Regulations for Construction  
Industry

CPL 2-0.124.....Multi-Employer Citation Policy

8. VHA Directive 2005-007

1.2 DEFINITIONS:

- A. OSHA "Competent Person" (CP). One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).
- B. "Qualified Person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- C. High Visibility Accident. Any mishap which may generate publicity or high visibility.
- D. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.
- E. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:



1. Death, regardless of the time between the injury and death, or the length of the illness;
2. Days away from work (any time lost after day of injury/illness onset);
3. Restricted work;
4. Transfer to another job;
5. Medical treatment beyond first aid;
6. Loss of consciousness; or
7. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

#### 1.3 REGULATORY REQUIREMENTS:

- A. In addition to the detailed requirements included in the provisions of this contract, comply with 29 CFR 1926, comply with 29 CFR 1910 as incorporated by reference within 29 CFR 1926, comply with ASSE A10.34, and all applicable [federal, state, and local] laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, **the most stringent requirements govern** except with specific approval and acceptance by the Contracting Officer Representative.

#### 1.4 ACCIDENT PREVENTION PLAN (APP):

- A. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent

one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

B. The APP shall be prepared as follows:

1. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
2. Address both the Prime Contractors and the subcontractors work operations.
3. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.
4. Address all the elements/sub-elements and in order as follows:
  - a. **SIGNATURE SHEET.** Title, signature, and phone number of the following:
    - (1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);
    - (2) Plan approver (company/corporate officers authorized to obligate the company);
    - (3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).
  - b. **BACKGROUND INFORMATION.** List the following:
    - (1) Contractor;
    - (2) Contract number;
    - (3) Project name;

- (4) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).

c. **STATEMENT OF SAFETY AND HEALTH POLICY.** Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor's written safety program goals, objectives, and accident experience goals for this contract should be provided.

d. **RESPONSIBILITIES AND LINES OF AUTHORITIES.** Provide the following:

- (1) A statement of the employer's ultimate responsibility for the implementation of his SOH program;
- (2) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes;
- (3) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached;
- (4) Requirements that no work shall be performed unless a designated competent person is present on the job site;
- (5) Requirements for pre-task Activity Hazard Analysis (AHAs);
- (6) Lines of authority;
- (7) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified;

e. **SUBCONTRACTORS AND SUPPLIERS.** If applicable, provide procedures for coordinating SOH activities with other employers on the job site:

- (1) Identification of subcontractors and suppliers (if known);
- (2) Safety responsibilities of subcontractors and suppliers.

**f. TRAINING.**

- (1) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.
- (2) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc...) and any requirements for periodic retraining/recertification are required.
- (3) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.
- (4) OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for Trade Competent Persons (CPs).

**g. SAFETY AND HEALTH INSPECTIONS.**

- (1) Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., "Site Safety and Health CP"), proof of inspector's training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.
- (2) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT).

**h. ACCIDENT INVESTIGATION & REPORTING.** The Contractor shall conduct mishap investigations of all OSHA Recordable Incidents. The APP shall include accident/incident investigation procedure & identify person(s) responsible to provide the following to the Contracting Officer Representative.

- (1) Exposure data (man-hours worked);
- (2) Accident investigations, reports, and logs.

i. **PLANS (PROGRAMS, PROCEDURES) REQUIRED.** Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks in site-specific compliance and accident prevention plans. These Plans shall include but are not be limited to procedures for addressing the risks associates with the following:

- (1) Emergency response;
- (2) Contingency for severe weather;
- (3) Fire Prevention ;
- (4) Medical Support;
- (5) Posting of emergency telephone numbers;
- (6) Prevention of alcohol and drug abuse;
- (7) Site sanitation (housekeeping, drinking water, toilets);
- (8) Night operations and lighting ;
- (9) Hazard communication program;
- (10) Welding/Cutting "Hot" work ;
- (11) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E);
- (12) General Electrical Safety
- (13) Hazardous energy control (Machine LOTO);
- (14) Site-Specific Fall Protection & Prevention;
- (15) Excavation/trenching;
- (16) Asbestos abatement;
- (17) Lead abatement;
- (18) Crane Critical lift;
- (19) Respiratory protection;

- (20) Health hazard control program;
- (21) Radiation Safety Program;
- (22) Abrasive blasting;
- (23) Heat/Cold Stress Monitoring;
- (24) Crystalline Silica Monitoring (Assessment);
- (25) Demolition plan (to include engineering survey);
- (26) Formwork and shoring erection and removal;
- (27) Precast Concrete.

- C. Submit the APP to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.
- D. Once accepted by the Contracting Officer Representative, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.
- E. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer Representative. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34) and the environment.

#### 1.5 ACTIVITY HAZARD ANALYSES (AHAs):

- A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous

project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site).

- B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
- C. Work shall not begin until the AHA for the work activity has been accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
  - 1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
  - 2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
    - a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
    - b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.

3. Submit AHAs to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES for review at least 15 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to Contracting Officer Representative.

#### 1.6 PRECONSTRUCTION CONFERENCE:

- A. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1), on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.
- B. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- C. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 days of submittal, and the Contractor shall



revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

1.7 "SITE SAFETY AND HEALTH OFFICER" (SSHO) and "COMPETENT PERSON" (CP):

- A. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. **This position can have collateral duties as the contractor's superintendent or quality manager.** Each subcontractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.
- B. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- C. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- D. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.
- E. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

1.8 TRAINING:

- A. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.
- B. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.
- C. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented "repeat" deficiencies in the execution of safety requirements will require retaking the requisite formal course.
- D. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.
- E. Submit training records associated with the above training requirements to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance.
- F. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the

Resident Engineer that individuals have undergone contractor's safety briefing.

- G. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

#### 1.9 INSPECTIONS:

- A. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of the their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly Contracting Officer Representative.
- B. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.
  - 1. Results of the inspection will be documented with tracking of the identified hazards to abatement.
  - 2. The Contracting Officer Representative will be notified immediately prior to start of the inspection and invited to accompany the inspection.
  - 3. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
  - 4. A report of the inspection findings with status of abatement will be provided to Contracting Officer Representative within one week of the onsite inspection.

#### 1.10 ACCIDENTS, OSHA 300 LOGS, AND MAN-HOURS:

- A. Notify the Contracting Officer Representative as soon as practical, but no more than four hours after any accident meeting the definition of OSHA Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$5,000, or any weight handling equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Contracting Officer Representative determines whether a government investigation will be conducted.
- B. Conduct an accident investigation for recordable injuries and illnesses, for Medical Treatment defined in paragraph DEFINITIONS, and property damage accidents resulting in at least \$20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162, and provide the report to the Contracting Officer Representative within 5 calendar days of the accident. The Contracting Officer Representative will provide copies of any required or special forms.
- C. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Contracting Officer Representative monthly.
- D. A summation of all OSHA recordable accidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Contracting Officer Representative monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Contracting Officer Representative as requested.

1.11 PERSONAL PROTECTIVE EQUIPMENT (PPE):

- A. PPE is governed in all areas by the nature of the work the employee is performing. For example, specific PPE required for performing work on electrical equipment is identified in NFPA 70E, Standard for Electrical Safety in the Workplace.
- B. Mandatory PPE includes:

1. Hard Hats - unless written authorization is given by Contracting Officer in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. However even with authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.
2. Safety glasses - unless written authorization is given by the Contracting Officer Representative appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.
3. Appropriate Safety Shoes - based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the Contracting Officer Representative.
4. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

#### 1.12 INFECTION CONTROL

- A. Infection Control is critical in all medical center facilities. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas. Exterior construction activities causing disturbance of soil or creates dust in some other manner must be controlled.
- B. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e. Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the Contracting Officer Representative before beginning any construction work. Risk classifications of Class III or higher will require a permit before beginning any construction work. The Infection Control Permits will be posted outside the appropriate construction area. More

than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The required infection control precautions with each class are as follows:

1. Class I requirements:

a. During Construction Work:

- i. Notify the Contracting Officer Representative.
- ii. Execute work by methods to minimize raising dust from construction operations.
- iii. Ceiling tiles: Immediately replace a ceiling tiles displaced for visual inspection.

b. Upon Completion:

- i. Clean work area upon completion of task.
- ii. Notify Contracting Officer Representative.

2. Class II requirements:

a. During Construction Work:

- i. Notify the Contracting Officer Representative.
- ii. Provide active means to prevent airborne dust from dispersing into atmosphere such as wet methods or tool mounted dust collectors where possible.
- iii. Water mist work surfaces to control dust while cutting.
- iv. Seal unused doors with duct tape.
- v. Block off and seal air vents.
- vi. Remove or isolate HVAC system in areas where work is being performed.

b. Upon Completion:

- i. Wipe work surfaces with cleaner/disinfectant.

- ii. Contain construction waste before transport in tightly covered containers.
- iii. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.
- iv. Upon completion, restore HVAC system where work was performed
- v. Notify the Contracting Officer Representative.

3. Class III requirements:

a. During Construction Work:

- i. Obtain permit from the Contracting Officer Representative.
- ii. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.
- iii. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non-work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.
- iv. Maintain negative air pressure, 0.01 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor.
- v. Contain construction waste before transport in tightly covered containers.

- vi. Cover transport receptacles or carts. Tape covering unless solid lid.

b. Upon Completion:

- i. Do not remove barriers from work area until completed project is inspected by Contracting Officer Representative and thoroughly cleaned by the VA Environmental Services Department.
- ii. Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
- iii. Vacuum work area with HEPA filtered vacuums.
- iv. Wet mop area with cleaner/disinfectant.
- v. Upon completion, restore HVAC system where work was performed.
- vi. Return permit to Contracting Officer Representative.

4. Class IV requirements:

a. During Construction Work:

- i. Obtain permit from the Contracting Officer Representative.
- ii. Isolate HVAC system in area where work is being done to prevent contamination of duct system.
- iii. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.



- iv. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
- v. Seal holes, pipes, conduits, and punctures.
- vi. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.
- vii. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.

b. Upon Completion:

- i. Do not remove barriers from work area until completed project is inspected by the Contracting Officer Representative with thorough cleaning by the VA Environmental Services Dept.
- ii. Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
- iii. Contain construction waste before transport in tightly covered containers.
- iv. Cover transport receptacles or carts. Tape covering unless solid lid.
- v. Vacuum work area with HEPA filtered vacuums.
- vi. Wet mop area with cleaner/disinfectant.
- vii. Upon completion, restore HVAC system where work was performed.
- viii. Return permit to the Contracting Officer Representative.

C. Barriers shall be erected as required based upon classification (Class III & IV requires barriers) and shall be constructed as follows:

1. Class III and IV - closed door with masking tape applied over the frame and door is acceptable for projects that can be contained in a single room.
2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected and made presentable on hospital occupied side:
  - i. Class III & IV (where dust control is the only hazard, and an agreement is reached with the Resident Engineer and Medical Center) - Airtight plastic barrier that extends from the floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping
  - ii. Class III & IV - Drywall barrier erected with joints covered or sealed to prevent dust and debris from escaping.
  - iii. Class III & IV - Seal all penetrations in existing barrier airtight
  - iv. Class III & IV - Barriers at penetration of ceiling envelopes, chases and ceiling spaces to stop movement air and debris
  - v. Class IV only - Anteroom or double entrance openings that allow workers to remove protective clothing or vacuum off existing clothing
  - vi. Class III & IV - At elevators shafts or stairways within the field of construction, overlapping flap minimum of two feet wide of polyethylene enclosures for personnel access.

D. Products and Materials:

1. Sheet Plastic: Fire retardant polystyrene, 6-mil thickness meeting local fire codes.
2. Barrier Doors: Self Closing, One-hour, Two-hour, fire-rated, solid core wood in steel frame, painted.

3. Dust proof, one-hour, two-hour, fire-rated, drywall.
  4. High Efficiency Particulate Air-Equipped filtration machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other pre-filter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer's instructions.
  5. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose
  6. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches
  7. Disinfectant: Hospital-approved disinfectant or equivalent product
  8. Portable Ceiling Access Module
- E. Before any construction on site begins, all contractor personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.
- F. A dust control program will be establish and maintained as part of the contractor's infection preventive measures in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, prepare a plan detailing project-specific dust protection measures with associated product data, including periodic status reports, and submit for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- G. Medical center Infection Control personnel will monitor for airborne disease (e.g. aspergillosis) during construction. A baseline of conditions will be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.

- H. In general, the following preventive measures shall be adopted during construction to keep down dust and prevent mold.
1. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. HEPA filtration is required where the exhaust dust may reenter the medical center.
  2. Exhaust hoses shall be exhausted so that dust is not reintroduced to the medical center.
  3. Adhesive Walk-off/Carpet Walk-off Mats shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
  4. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as it is created. Transport these outside the construction area in containers with tightly fitting lids.
  5. The contractor shall not haul debris through patient-care areas without prior approval of the Resident Engineer and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
- h. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
- i. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.

I. Final Cleanup:

1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
3. All new air ducts shall be cleaned prior to final inspection.

J. Exterior Construction

1. Contractor shall verify that dust will not be introduced into the medical center through intake vents, or building openings. HEPA filtration on intake vents is required where dust may be introduced.
2. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary
3. **All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e. vacuum systems) or wet suppression controls.**

1.13 TUBERCULOSIS SCREENING

- A. Contractor shall provide written certification that all contract employees assigned to the work site have had a pre-placement tuberculin screening within 90 days prior to assignment to the worksite and been found have negative TB screening reactions. Contractors shall be required to show documentation of negative TB screening reactions for any additional workers who are added after the 90-day requirement before they will be allowed to work on the work site. NOTE: This can be the Center for Disease Control (CDC) and Prevention and two-step skin testing or a Food and Drug Administration (FDA)-approved blood test.

1. Contract employees manifesting positive screening reactions to the tuberculin shall be examined according to current CDC guidelines prior to working on VHA property.

2. Subsequently, if the employee is found without evidence of active (infectious) pulmonary TB, a statement documenting examination by a physician shall be on file with the employer (construction contractor), noting that the employee with a positive tuberculin screening test is without evidence of active (infectious) pulmonary TB.
3. If the employee is found with evidence of active (infectious) pulmonary TB, the employee shall require treatment with a subsequent statement to the fact on file with the employer before being allowed to return to work on VHA property.

#### 1.14 FIRE SAFETY

- B. Fire Safety Plan: Establish and maintain a site-specific fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. This plan may be an element of the Accident Prevention Plan.
- C. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- C. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- D. Temporary Construction Partitions:
  1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas, the areas that are described in phasing requirements, and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.

2. Install one-hour, two-hour, fire-rated and/or temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
  3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration fire-stop materials in accordance with Section 07 84 00, FIRESTOPPING.
- E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
  - F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Contracting Officer Representative.
  - G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Contracting Officer Representative.
  - H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
  - I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
  - J. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.
  - K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate Contracting Officer Representative. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.
  - L. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Contracting Officer Representative.

- M. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Facility Safety Office. Obtain permits from Officer at least 72 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.
- N. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.
- O. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- P. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- Q. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

#### 1.15 ELECTRICAL

- A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J - General Environmental Controls, 29 CFR Part 1910 Subpart S - Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.
- B. All qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.
- C. **All electrical work will be accomplished de-energized and in the Electrically Safe Work Condition** (refer to NFPA 70E for *Work Involving Electrical Hazards, including Exemptions to Work Permit*). Any Contractor, subcontractor or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in rare circumstance where achieving an electrically safe work condition prior to beginning work would increase or cause additional hazards, or is infeasible due to equipment design or operational limitations is energized work permitted. The



Contracting Officer Representative with approval of the Medical Center Director will make the determination if the circumstances would meet the exception outlined above. An AHA specific to energized work activities will be developed, reviewed, and accepted prior to the start of that work.

1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.
  2. Verification of the absence of voltage after de-energization and lockout/tagout is considered "energized electrical work" (live work) under NFPA 70E, and shall only be performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.
  3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the Contracting Officer Representative.
- D.** Before beginning any electrical work, an Activity Hazard Analysis (AHA) will be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alternative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity has been accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
- E.** Ground-fault circuit interrupters. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites shall have approved ground-fault circuit interrupters for personnel protection. "Assured Equipment Grounding Conductor Program" only is not allowed.

#### 1.16 FALL PROTECTION

- A. The **fall protection (FP) threshold height requirement is 6 ft (1.8 m) for ALL WORK, unless specified differently or the OSHA 29 CFR 1926 requirements are more stringent**, to include steel erection activities, systems-engineered activities (prefabricated) metal buildings, residential (wood) construction and scaffolding work.
1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
  2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
  3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require FP. No worker shall be allowed in the area between the roof or floor edge and the WLS without FP. FP is required when working outside the WLS.
  4. Fall protection while using a ladder will be governed by the OSHA requirements.

#### 1.17 SCAFFOLDS AND OTHER WORK PLATFORMS

- A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.
- B. The **fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16**.
- C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.
1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
  2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.

3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
  4. Emergency descent devices shall not be used as working platforms.
- D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:
1. The Competent Person's name and signature;
  2. Dates of initial and last inspections.
- E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.

#### 1.18 EXCAVATION AND TRENCHES

- A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P.
- B. All excavations and trenches 5 feet in depth or greater shall require a written trenching and excavation permit (NOTE - some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall be completed and provided to the Facility Safety prior to commencing work for the day. At the end of the day, the permit shall be closed out and provided to the Facility Safety Manager. The permit shall be maintained onsite and include the following:
1. Determination of soil classification
  2. Indication that utilities have been located and identified. If utilities could not be located after all reasonable attempt, then excavating operations will proceed cautiously.
  3. Indication of selected excavation protective system.

4. Indication that the spoil pile will be stored at least 2 feet from the edge of the excavation and safe access provided within 25 feet of the workers.
  5. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere.
- C. If not using an engineered protective system such as a trench box, shielding, shoring, or other Professional Engineer designed system and using a sloping or benching system, soil classification cannot be Solid Rock or Type A. All soil will be classified as Type B or Type C and sloped or benched in accordance with Appendix B of 29 CFR 1926.

#### 1.19 CRANES

- A. All crane work shall comply with 29 CFR 1926 Subpart CC.
- B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no "Phase In" date of November 10, 2014.
- C. A detailed lift permit shall be submitted 14 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, siting of crane and path of swing. The lift will not be allowed without approval of this document.
- D. Crane operators shall not carry loads
1. over the general public or VAMC personnel
  2. over any occupied building unless
    - i. the top two floors are vacated
    - ii. or overhead protection with a design live load of 300 psf is provided

#### 1.20 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

- A. All installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment [1926.702(j)], heavy machinery & equipment [1926.600(a)(3)(i)], and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with

Section 1.15 to include NFPA 70E and other VA specific requirements discussed in the section.

#### 1.21 CONFINED SPACE ENTRY

- A. All confined space entry shall comply with 29 CFR 1910.146 except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches [1926.651(g)].
- B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the Project Manager.

#### 1.22 WELDING AND CUTTING

- A. As specified in section 1.14, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Facility Safety Manager. Obtain permits from Facility Safety Manager at least 72 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.

#### 1.23 LADDERS

- A. All Ladder use shall comply with 29 CFR 1926 Subpart X.
- B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.
- C. Manufacturer safety labels shall be in place on ladders
- D. Step Ladders shall not be used in the closed position
- E. Top steps or cap of step ladders shall not be used as a step
- F. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.
  - 1. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
  - 2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.

- G. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "**DO NOT USE**," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

#### 1.24 FLOOR & WALL OPENINGS

- A. All floor and wall openings shall comply with 29 CFR 1926 Subpart M.
- B. Floor and roof holes/openings are any that measure over 2 in (51 mm) in any direction of a walking/working surface which persons may trip or fall into or where objects may fall to the level below. See 21.F for covering and labeling requirements. ***Skylights located in floors or roofs are considered floor or roof hole/openings.***
- C. All floor, roof openings or hole into which a person can accidentally walk or fall through shall be guarded either by a railing system with toeboards along all exposed sides or a load-bearing cover. When the cover is not in place, the opening or hole shall be protected by a removable guardrail system or shall be attended when the guarding system has been removed or other fall protection system.
1. Covers shall be capable of supporting, without failure, at least twice the weight of the worker, equipment and material combined.
  2. Covers shall be secured when installed, clearly marked with the word "HOLE", "COVER" or "Danger, Roof Opening-Do Not Remove" or color-coded or equivalent methods (e.g., red or orange "X"). Workers must be made aware of the meaning for color coding and equivalent methods.
  3. Roofing material, such as roofing membrane, insulation or felts, covering or partly covering openings or holes, shall be immediately cut out. No hole or opening shall be left unattended unless covered.
  4. Non-load-bearing skylights shall be guarded by a load-bearing skylight screen, cover, or railing system along all exposed sides.

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**SECTION 01 35 26**  
**SAFETY REQUIREMENTS**

1.25 APPLICABLE PUBLICATIONS:

B. Latest publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

9. American Society of Safety Engineers (ASSE):

A10.1-2011.....Pre-Project & Pre-Task Safety and Health  
Planning

A10.34-2012.....Protection of the Public on or Adjacent to  
Construction Sites

A10.38-2013.....Basic Elements of an Employer's Program to  
Provide a Safe and Healthful Work Environment  
American National Standard Construction and  
Demolition Operations

10. American Society for Testing and Materials (ASTM):

E84-2013.....Surface Burning Characteristics of Building  
Materials

11. The Facilities Guidelines Institute (FGI):

FGI Guidelines-2010Guidelines for Design and Construction of  
Healthcare Facilities

12. National Fire Protection Association (NFPA):

10-2013.....Standard for Portable Fire Extinguishers

30-2012.....Flammable and Combustible Liquids Code

51B-2014.....Standard for Fire Prevention During Welding,  
Cutting and Other Hot Work

70-2014.....National Electrical Code

70B-2013.....Recommended Practice for Electrical Equipment  
Maintenance

70E-2012 .....Standard for Electrical Safety in the Workplace

99-2012.....Health Care Facilities Code

241-2013.....Standard for Safeguarding Construction,  
Alteration, and Demolition Operations

13. The Joint Commission (TJC)

TJC Manual .....Comprehensive Accreditation and Certification  
Manual

14. U. S. Nuclear Regulatory Commission

10 CFR 20 .....Standards for Protection Against Radiation

15. U. S. Occupational Safety and Health Administration (OSHA):

29 CFR 1904 .....Reporting and Recording Injuries & Illnesses

29 CFR 1910 .....Safety and Health Regulations for General  
Industry

29 CFR 1926 .....Safety and Health Regulations for Construction  
Industry

CPL 2-0.124.....Multi-Employer Citation Policy

16. VHA Directive 2005-007

1.26 DEFINITIONS:

F. OSHA "Competent Person" (CP). One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).

G. "Qualified Person" means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

H. High Visibility Accident. Any mishap which may generate publicity or high visibility.

I. Medical Treatment. Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even through provided by a physician or registered personnel.

J. Recordable Injuries or Illnesses. Any work-related injury or illness that results in:



8. Death, regardless of the time between the injury and death, or the length of the illness;
9. Days away from work (any time lost after day of injury/illness onset);
10. Restricted work;
11. Transfer to another job;
12. Medical treatment beyond first aid;
13. Loss of consciousness; or
14. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.

1.27 REGULATORY REQUIREMENTS:

- B. In addition to the detailed requirements included in the provisions of this contract, comply with 29 CFR 1926, comply with 29 CFR 1910 as incorporated by reference within 29 CFR 1926, comply with ASSE A10.34, and all applicable [federal, state, and local] laws, ordinances, criteria, rules and regulations. Submit matters of interpretation of standards for resolution before starting work. Where the requirements of this specification, applicable laws, criteria, ordinances, regulations, and referenced documents vary, **the most stringent requirements govern** except with specific approval and acceptance by the Contracting Officer Representative.

1.28 ACCIDENT PREVENTION PLAN (APP):

- F. The APP (aka Construction Safety & Health Plan) shall interface with the Contractor's overall safety and health program. Include any portions of the Contractor's overall safety and health program referenced in the APP in the applicable APP element and ensure it is site-specific. The Government considers the Prime Contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent

one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.

G. The APP shall be prepared as follows:

5. Written in English by a qualified person who is employed by the Prime Contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.

6. Address both the Prime Contractors and the subcontractors work operations.

7. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.

8. Address all the elements/sub-elements and in order as follows:

j. **SIGNATURE SHEET.** Title, signature, and phone number of the following:

(1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);

(2) Plan approver (company/corporate officers authorized to obligate the company);

(3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).

k. **BACKGROUND INFORMATION.** List the following:

(5) Contractor;

(6) Contract number;

(7) Project name;

(8) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).

l. **STATEMENT OF SAFETY AND HEALTH POLICY.** Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor's written safety program goals, objectives, and accident experience goals for this contract should be provided.

m. **RESPONSIBILITIES AND LINES OF AUTHORITIES.** Provide the following:

(8) A statement of the employer's ultimate responsibility for the implementation of his SOH program;

(9) Identification and accountability of personnel responsible for safety at both corporate and project level. Contracts specifically requiring safety or industrial hygiene personnel shall include a copy of their resumes;

(10) The names of Competent and/or Qualified Person(s) and proof of competency/qualification to meet specific OSHA Competent/Qualified Person(s) requirements must be attached;

(11) Requirements that no work shall be performed unless a designated competent person is present on the job site;

(12) Requirements for pre-task Activity Hazard Analysis (AHAs);

(13) Lines of authority;

(14) Policies and procedures regarding noncompliance with safety requirements (to include disciplinary actions for violation of safety requirements) should be identified;

n. **SUBCONTRACTORS AND SUPPLIERS.** If applicable, provide procedures for coordinating SOH activities with other employers on the job site:

(3) Identification of subcontractors and suppliers (if known);

(4) Safety responsibilities of subcontractors and suppliers.

**o. TRAINING.**

- (5) Site-specific SOH orientation training at the time of initial hire or assignment to the project for every employee before working on the project site is required.
- (6) Mandatory training and certifications that are applicable to this project (e.g., explosive actuated tools, crane operator, rigger, crane signal person, fall protection, electrical lockout/NFPA 70E, machine/equipment lockout, confined space, etc...) and any requirements for periodic retraining/recertification are required.
- (7) Procedures for ongoing safety and health training for supervisors and employees shall be established to address changes in site hazards/conditions.
- (8) OSHA 10-hour training is required for all workers on site and the OSHA 30-hour training is required for Trade Competent Persons (CPs).

**p. SAFETY AND HEALTH INSPECTIONS.**

- (3) Specific assignment of responsibilities for a minimum daily job site safety and health inspection during periods of work activity: Who will conduct (e.g., "Site Safety and Health CP"), proof of inspector's training/qualifications, when inspections will be conducted, procedures for documentation, deficiency tracking system, and follow-up procedures.
- (4) Any external inspections/certifications that may be required (e.g., contracted CSP or CSHT).

**q. ACCIDENT INVESTIGATION & REPORTING.** The Contractor shall conduct mishap investigations of all OSHA Recordable Incidents. The APP shall include accident/incident investigation procedure & identify person(s) responsible to provide the following to the Contracting Officer Representative.

- (3) Exposure data (man-hours worked);
- (4) Accident investigations, reports, and logs.

r. **PLANS (PROGRAMS, PROCEDURES) REQUIRED.** Based on a risk assessment of contracted activities and on mandatory OSHA compliance programs, the Contractor shall address all applicable occupational risks in site-specific compliance and accident prevention plans. These Plans shall include but are not be limited to procedures for addressing the risks associates with the following:

- (28) Emergency response;
- (29) Contingency for severe weather;
- (30) Fire Prevention ;
- (31) Medical Support;
- (32) Posting of emergency telephone numbers;
- (33) Prevention of alcohol and drug abuse;
- (34) Site sanitation (housekeeping, drinking water, toilets);
- (35) Night operations and lighting ;
- (36) Hazard communication program;
- (37) Welding/Cutting "Hot" work ;
- (38) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E);
- (39) General Electrical Safety
- (40) Hazardous energy control (Machine LOTO);
- (41) Site-Specific Fall Protection & Prevention;
- (42) Excavation/trenching;
- (43) Asbestos abatement;
- (44) Lead abatement;
- (45) Crane Critical lift;
- (46) Respiratory protection;

- (47) Health hazard control program;
- (48) Radiation Safety Program;
- (49) Abrasive blasting;
- (50) Heat/Cold Stress Monitoring;
- (51) Crystalline Silica Monitoring (Assessment);
- (52) Demolition plan (to include engineering survey);
- (53) Formwork and shoring erection and removal;
- (54) Precast Concrete.

H. Submit the APP to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance. Work cannot proceed without an accepted APP.

I. Once accepted by the Contracting Officer Representative, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.

J. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer Representative. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34) and the environment.

#### 1.29 ACTIVITY HAZARD ANALYSES (AHAs):

A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous

project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site).

- B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
  - C. Work shall not begin until the AHA for the work activity has been accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
- 6. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
  - 7. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
    - a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
    - b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.

8. Submit AHAs to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES for review at least 15 calendar days prior to the start of each phase. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
9. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
10. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to Contracting Officer Representative.

1.30 PRECONSTRUCTION CONFERENCE:

- D. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1), on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.
- E. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the Contractor and the Contracting Officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.
- F. Deficiencies in the submitted APP will be brought to the attention of the Contractor within 14 days of submittal, and the Contractor shall



revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

1.31 "SITE SAFETY AND HEALTH OFFICER" (SSHO) and "COMPETENT PERSON" (CP):

- F. The Prime Contractor shall designate a minimum of one SSHO at each project site that will be identified as the SSHO to administer the Contractor's safety program and government-accepted Accident Prevention Plan. **This position can have collateral duties as the contractor's superintendent or quality manager.** Each subcontractor shall designate a minimum of one CP in compliance with 29 CFR 1926.20 (b)(2) that will be identified as a CP to administer their individual safety programs.
- G. Further, all specialized Competent Persons for the work crews will be supplied by the respective contractor as required by 29 CFR 1926 (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- H. These Competent Persons can have collateral duties as the subcontractor's superintendent and/or work crew lead persons as well as fill more than one specialized CP role (i.e. Asbestos, Electrical, Cranes, & Derricks, Demolition, Fall Protection, Fire Safety/Life Safety, Ladder, Rigging, Scaffolds, and Trenches/Excavations).
- I. The SSHO or an equally-qualified Designated Representative/alternate will maintain a presence on the site during construction operations in accordance with FAR Clause 52.236-6: *Superintendence by the Contractor*. CPs will maintain presence during their construction activities in accordance with above mentioned clause. A listing of the designated SSHO and all known CPs shall be submitted prior to the start of work as part of the APP with the training documentation and/or AHA as listed in Section 1.8 below.
- J. The repeated presence of uncontrolled hazards during a contractor's work operations will result in the designated CP as being deemed incompetent and result in the required removal of the employee in accordance with FAR Clause 52.236-5: Material and Workmanship, Paragraph (c).

1.32 TRAINING:

- H. The designated Prime Contractor SSHO must meet the requirements of all applicable OSHA standards and be capable (through training, experience, and qualifications) of ensuring that the requirements of 29 CFR 1926.16 and other appropriate Federal, State and local requirements are met for the project. As a minimum the SSHO must have completed the OSHA 30-hour Construction Safety class and have five (5) years of construction industry safety experience or three (3) years if he/she possesses a Certified Safety Professional (CSP) or certified Construction Safety and Health Technician (CSHT) certification or have a safety and health degree from an accredited university or college.
- I. All designated CPs shall have completed the OSHA 30-hour Construction Safety course within the past 5 years.
- J. In addition to the OSHA 30 Hour Construction Safety Course, all CPs with high hazard work operations such as operations involving asbestos, electrical, cranes, demolition, work at heights/fall protection, fire safety/life safety, ladder, rigging, scaffolds, and trenches/excavations shall have a specialized formal course in the hazard recognition & control associated with those high hazard work operations. Documented "repeat" deficiencies in the execution of safety requirements will require retaking the requisite formal course.
- K. All other construction workers shall have the OSHA 10-hour Construction Safety Outreach course and any necessary safety training to be able to identify hazards within their work environment.
- L. Submit training records associated with the above training requirements to the Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES 15 calendar days prior to the date of the preconstruction conference for acceptance.
- M. Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the SSHO or his/her designated representative. As a minimum, this briefing shall include information on the site-specific hazards, construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, emergency procedures, accident reporting etc... Documentation shall be provided to the

Resident Engineer that individuals have undergone contractor's safety briefing.

- N. Ongoing safety training will be accomplished in the form of weekly documented safety meeting.

#### 1.33 INSPECTIONS:

- C. The SSHO shall conduct frequent and regular safety inspections (daily) of the site and each of the subcontractors CPs shall conduct frequent and regular safety inspections (daily) of the their work operations as required by 29 CFR 1926.20(b)(2). Each week, the SSHO shall conduct a formal documented inspection of the entire construction areas with the subcontractors' "Trade Safety and Health CPs" present in their work areas. Coordinate with, and report findings and corrective actions weekly Contracting Officer Representative.
  - D. A Certified Safety Professional (CSP) with specialized knowledge in construction safety or a certified Construction Safety and Health Technician (CSHT) shall randomly conduct a monthly site safety inspection. The CSP or CSHT can be a corporate safety professional or independently contracted. The CSP or CSHT will provide their certificate number on the required report for verification as necessary.
- 5. Results of the inspection will be documented with tracking of the identified hazards to abatement.
  - 6. The Contracting Officer Representative will be notified immediately prior to start of the inspection and invited to accompany the inspection.
  - 7. Identified hazard and controls will be discussed to come to a mutual understanding to ensure abatement and prevent future reoccurrence.
  - 8. A report of the inspection findings with status of abatement will be provided to Contracting Officer Representative within one week of the onsite inspection.

#### 1.34 ACCIDENTS, OSHA 300 LOGS, AND MAN-HOURS:

- E. Notify the Contracting Officer Representative as soon as practical, but no more than four hours after any accident meeting the definition of OSHA Recordable Injuries or Illnesses or High Visibility Accidents, property damage equal to or greater than \$5,000, or any weight handling equipment accident. Within notification include contractor name; contract title; type of contract; name of activity, installation or location where accident occurred; date and time of accident; names of personnel injured; extent of property damage, if any; extent of injury, if known, and brief description of accident (to include type of construction equipment used, PPE used, etc.). Preserve the conditions and evidence on the accident site until the Contracting Officer Representative determines whether a government investigation will be conducted.
- F. Conduct an accident investigation for recordable injuries and illnesses, for Medical Treatment defined in paragraph DEFINITIONS, and property damage accidents resulting in at least \$20,000 in damages, to establish the root cause(s) of the accident. Complete the VA Form 2162, and provide the report to the Contracting Officer Representative within 5 calendar days of the accident. The Contracting Officer Representative will provide copies of any required or special forms.
- G. A summation of all man-hours worked by the contractor and associated sub-contractors for each month will be reported to the Contracting Officer Representative monthly.
- H. A summation of all OSHA recordable accidents experienced on site by the contractor and associated sub-contractors for each month will be provided to the Contracting Officer Representative monthly. The contractor and associated sub-contractors' OSHA 300 logs will be made available to the Contracting Officer Representative as requested.

1.35 PERSONAL PROTECTIVE EQUIPMENT (PPE):

- C. PPE is governed in all areas by the nature of the work the employee is performing. For example, specific PPE required for performing work on electrical equipment is identified in NFPA 70E, Standard for Electrical Safety in the Workplace.
- D. Mandatory PPE includes:

5. Hard Hats - unless written authorization is given by Contracting Officer in circumstances of work operations that have limited potential for falling object hazards such as during finishing work or minor remodeling. However even with authorization to relax the requirement of hard hats, if a worker becomes exposed to an overhead falling object hazard, then hard hats would be required in accordance with the OSHA regulations.
6. Safety glasses - unless written authorization is given by the Contracting Officer Representative appropriate safety glasses meeting the ANSI Z.87.1 standard must be worn by each person on site.
7. Appropriate Safety Shoes - based on the hazards present, safety shoes meeting the requirements of ASTM F2413-11 shall be worn by each person on site unless written authorization is given by the Contracting Officer Representative.
8. Hearing protection - Use personal hearing protection at all times in designated noise hazardous areas or when performing noise hazardous tasks.

#### 1.36 INFECTION CONTROL

- H. Infection Control is critical in all medical center facilities. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas. Exterior construction activities causing disturbance of soil or creates dust in some other manner must be controlled.
- I. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e. Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the Contracting Officer Representative before beginning any construction work. Risk classifications of Class III or higher will require a permit before beginning any construction work. The Infection Control Permits will be posted outside the appropriate construction area. More

than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The required infection control precautions with each class are as follows:

5. Class I requirements:

a. During Construction Work:

- i. Notify the Contracting Officer Representative.
- ii. Execute work by methods to minimize raising dust from construction operations.
- iii. Ceiling tiles: Immediately replace a ceiling tiles displaced for visual inspection.

b. Upon Completion:

- i. Clean work area upon completion of task.
- ii. Notify Contracting Officer Representative.

6. Class II requirements:

a. During Construction Work:

- i. Notify the Contracting Officer Representative.
- ii. Provide active means to prevent airborne dust from dispersing into atmosphere such as wet methods or tool mounted dust collectors where possible.
- iii. Water mist work surfaces to control dust while cutting.
- iv. Seal unused doors with duct tape.
- v. Block off and seal air vents.
- vi. Remove or isolate HVAC system in areas where work is being performed.

b. Upon Completion:

- i. Wipe work surfaces with cleaner/disinfectant.

- ii. Contain construction waste before transport in tightly covered containers.
- iii. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.
- iv. Upon completion, restore HVAC system where work was performed
- v. Notify the Contracting Officer Representative.

7. Class III requirements:

a. During Construction Work:

- i. Obtain permit from the Contracting Officer Representative.
- ii. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.
- iii. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.
- iv. Maintain negative air pressure, 0.01 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor.
- v. Contain construction waste before transport in tightly covered containers.

- vi. Cover transport receptacles or carts. Tape covering unless solid lid.

b. Upon Completion:

- i. Do not remove barriers from work area until completed project is inspected by Contracting Officer Representative and thoroughly cleaned by the VA Environmental Services Department.
- ii. Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
- iii. Vacuum work area with HEPA filtered vacuums.
- iv. Wet mop area with cleaner/disinfectant.
- v. Upon completion, restore HVAC system where work was performed.
- vi. Return permit to Contracting Officer Representative.

8. Class IV requirements:

a. During Construction Work:

- i. Obtain permit from the Contracting Officer Representative.
- ii. Isolate HVAC system in area where work is being done to prevent contamination of duct system.
- iii. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours.



- iv. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
- v. Seal holes, pipes, conduits, and punctures.
- vi. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.
- vii. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.

b. Upon Completion:

- i. Do not remove barriers from work area until completed project is inspected by the Contracting Officer Representative with thorough cleaning by the VA Environmental Services Dept.
- ii. Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
- iii. Contain construction waste before transport in tightly covered containers.
- iv. Cover transport receptacles or carts. Tape covering unless solid lid.
- v. Vacuum work area with HEPA filtered vacuums.
- vi. Wet mop area with cleaner/disinfectant.
- vii. Upon completion, restore HVAC system where work was performed.
- viii. Return permit to the Contracting Officer Representative.

J. Barriers shall be erected as required based upon classification (Class III & IV requires barriers) and shall be constructed as follows:

1. Class III and IV - closed door with masking tape applied over the frame and door is acceptable for projects that can be contained in a single room.
2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected and made presentable on hospital occupied side:
  - i. Class III & IV (where dust control is the only hazard, and an agreement is reached with the Resident Engineer and Medical Center) - Airtight plastic barrier that extends from the floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping
  - ii. Class III & IV - Drywall barrier erected with joints covered or sealed to prevent dust and debris from escaping.
  - iii. Class III & IV - Seal all penetrations in existing barrier airtight
  - iv. Class III & IV - Barriers at penetration of ceiling envelopes, chases and ceiling spaces to stop movement air and debris
  - v. Class IV only - Anteroom or double entrance openings that allow workers to remove protective clothing or vacuum off existing clothing
  - vi. Class III & IV - At elevators shafts or stairways within the field of construction, overlapping flap minimum of two feet wide of polyethylene enclosures for personnel access.

K. Products and Materials:

1. Sheet Plastic: Fire retardant polystyrene, 6-mil thickness meeting local fire codes.
2. Barrier Doors: Self Closing, One-hour, Two-hour, fire-rated, solid core wood in steel frame, painted.

3. Dust proof, one-hour, two-hour, fire-rated, drywall.
  4. High Efficiency Particulate Air-Equipped filtration machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other pre-filter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer's instructions.
  5. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose
  6. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches
  7. Disinfectant: Hospital-approved disinfectant or equivalent product
  8. Portable Ceiling Access Module
- L. Before any construction on site begins, all contractor personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.
- M. A dust control program will be establish and maintained as part of the contractor's infection preventive measures in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, prepare a plan detailing project-specific dust protection measures with associated product data, including periodic status reports, and submit for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- N. Medical center Infection Control personnel will monitor for airborne disease (e.g. aspergillosis) during construction. A baseline of conditions will be established by the medical center prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.

- H. In general, the following preventive measures shall be adopted during construction to keep down dust and prevent mold.
1. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. HEPA filtration is required where the exhaust dust may reenter the medical center.
  6. Exhaust hoses shall be exhausted so that dust is not reintroduced to the medical center.
  7. Adhesive Walk-off/Carpet Walk-off Mats shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
  8. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as it is created. Transport these outside the construction area in containers with tightly fitting lids.
  9. The contractor shall not haul debris through patient-care areas without prior approval of the Resident Engineer and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
  - j. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
  - k. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.

K. Final Cleanup:

1. Upon completion of project, or as work progresses, remove all construction debris from above ceiling, vertical shafts and utility chases that have been part of the construction.
2. Perform HEPA vacuum cleaning of all surfaces in the construction area. This includes walls, ceilings, cabinets, furniture (built-in or free standing), partitions, flooring, etc.
3. All new air ducts shall be cleaned prior to final inspection.

L. Exterior Construction

4. Contractor shall verify that dust will not be introduced into the medical center through intake vents, or building openings. HEPA filtration on intake vents is required where dust may be introduced.
5. Dust created from disturbance of soil such as from vehicle movement will be wetted with use of a water truck as necessary
6. **All cutting, drilling, grinding, sanding, or disturbance of materials shall be accomplished with tools equipped with either local exhaust ventilation (i.e. vacuum systems) or wet suppression controls.**

1.37 TUBERCULOSIS SCREENING

- A. Contractor shall provide written certification that all contract employees assigned to the work site have had a pre-placement tuberculin screening within 90 days prior to assignment to the worksite and been found have negative TB screening reactions. Contractors shall be required to show documentation of negative TB screening reactions for any additional workers who are added after the 90-day requirement before they will be allowed to work on the work site. NOTE: This can be the Center for Disease Control (CDC) and Prevention and two-step skin testing or a Food and Drug Administration (FDA)-approved blood test.

1. Contract employees manifesting positive screening reactions to the tuberculin shall be examined according to current CDC guidelines prior to working on VHA property.

2. Subsequently, if the employee is found without evidence of active (infectious) pulmonary TB, a statement documenting examination by a physician shall be on file with the employer (construction contractor), noting that the employee with a positive tuberculin screening test is without evidence of active (infectious) pulmonary TB.
3. If the employee is found with evidence of active (infectious) pulmonary TB, the employee shall require treatment with a subsequent statement to the fact on file with the employer before being allowed to return to work on VHA property.

#### 1.38 FIRE SAFETY

- D. Fire Safety Plan: Establish and maintain a site-specific fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Contracting Officer Representative for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. This plan may be an element of the Accident Prevention Plan.
- E. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- C. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).
- D. Temporary Construction Partitions:
  1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas, the areas that are described in phasing requirements, and adjoining areas. Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.

2. Install one-hour, two-hour, fire-rated and/or temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
  3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings. Seal penetrations with listed through-penetration fire-stop materials in accordance with Section 07 84 00, FIRESTOPPING.
- E. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
  - F. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Contracting Officer Representative.
  - G. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Contracting Officer Representative.
  - H. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
  - I. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
  - J. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.
  - K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate Contracting Officer Representative. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.
  - L. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with Contracting Officer Representative.

- M. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Facility Safety Office. Obtain permits from Officer at least 72 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.
- N. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.
- O. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- P. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- Q. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.39 ELECTRICAL

- A. All electrical work shall comply with NFPA 70 (NEC), NFPA 70B, NFPA 70E, 29 CFR Part 1910 Subpart J - General Environmental Controls, 29 CFR Part 1910 Subpart S - Electrical, and 29 CFR 1926 Subpart K in addition to other references required by contract.
- B. All qualified persons performing electrical work under this contract shall be licensed journeyman or master electricians. All apprentice electricians performing under this contract shall be deemed unqualified persons unless they are working under the immediate supervision of a licensed electrician or master electrician.
- C. **All electrical work will be accomplished de-energized and in the Electrically Safe Work Condition** (refer to NFPA 70E for *Work Involving Electrical Hazards, including Exemptions to Work Permit*). Any Contractor, subcontractor or temporary worker who fails to fully comply with this requirement is subject to immediate termination in accordance with FAR clause 52.236-5(c). Only in rare circumstance where achieving an electrically safe work condition prior to beginning work would increase or cause additional hazards, or is infeasible due to equipment design or operational limitations is energized work permitted. The



Contracting Officer Representative with approval of the Medical Center Director will make the determination if the circumstances would meet the exception outlined above. An AHA specific to energized work activities will be developed, reviewed, and accepted prior to the start of that work.

1. Development of a Hazardous Electrical Energy Control Procedure is required prior to de-energization. A single Simple Lockout/Tagout Procedure for multiple work operations can only be used for work involving qualified person(s) de-energizing one set of conductors or circuit part source. Task specific Complex Lockout/Tagout Procedures are required at all other times.
  2. Verification of the absence of voltage after de-energization and lockout/tagout is considered "energized electrical work" (live work) under NFPA 70E, and shall only be performed by qualified persons wearing appropriate shock protective (voltage rated) gloves and arc rate personal protective clothing and equipment, using Underwriters Laboratories (UL) tested and appropriately rated contact electrical testing instruments or equipment appropriate for the environment in which they will be used.
  3. Personal Protective Equipment (PPE) and electrical testing instruments will be readily available for inspection by the Contracting Officer Representative.
- D.** Before beginning any electrical work, an Activity Hazard Analysis (AHA) will be conducted to include Shock Hazard and Arc Flash Hazard analyses (NFPA Tables can be used only as a last alternative and it is strongly suggested a full Arc Flash Hazard Analyses be conducted). Work shall not begin until the AHA for the work activity has been accepted by the Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
- E.** Ground-fault circuit interrupters. All 120-volt, single-phase 15- and 20-ampere receptacle outlets on construction sites shall have approved ground-fault circuit interrupters for personnel protection. "Assured Equipment Grounding Conductor Program" only is not allowed.

#### 1.40 FALL PROTECTION

A. The **fall protection (FP) threshold height requirement is 6 ft (1.8 m) for ALL WORK, unless specified differently or the OSHA 29 CFR 1926 requirements are more stringent**, to include steel erection activities, systems-engineered activities (prefabricated) metal buildings, residential (wood) construction and scaffolding work.

1. The use of a Safety Monitoring System (SMS) as a fall protection method is prohibited.
2. The use of Controlled Access Zone (CAZ) as a fall protection method is prohibited.
3. A Warning Line System (WLS) may ONLY be used on floors or flat or low-sloped roofs (between 0 - 18.4 degrees or 4:12 slope) and shall be erected around all sides of the work area (See 29 CFR 1926.502(f) for construction of WLS requirements). Working within the WLS does not require FP. No worker shall be allowed in the area between the roof or floor edge and the WLS without FP. FP is required when working outside the WLS.
4. Fall protection while using a ladder will be governed by the OSHA requirements.

#### 1.41 SCAFFOLDS AND OTHER WORK PLATFORMS

- A. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.
- B. The **fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16**.
- C. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.
1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
  2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.

3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
  4. Emergency descent devices shall not be used as working platforms.
- D. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:
1. The Competent Person's name and signature;
  2. Dates of initial and last inspections.
- E. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.

#### 1.42 EXCAVATION AND TRENCHES

- A. All excavation and trenching work shall comply with 29 CFR 1926 Subpart P.
- B. All excavations and trenches 5 feet in depth or greater shall require a written trenching and excavation permit (NOTE - some States and other local jurisdictions require separate state/jurisdiction-issued excavation permits). The permit shall be completed and provided to the Facility Safety prior to commencing work for the day. At the end of the day, the permit shall be closed out and provided to the Facility Safety Manager. The permit shall be maintained onsite and include the following:
1. Determination of soil classification
  2. Indication that utilities have been located and identified. If utilities could not be located after all reasonable attempt, then excavating operations will proceed cautiously.
  3. Indication of selected excavation protective system.

4. Indication that the spoil pile will be stored at least 2 feet from the edge of the excavation and safe access provided within 25 feet of the workers.
  5. Indication of assessment for a potential toxic, explosive, or oxygen deficient atmosphere.
- C. If not using an engineered protective system such as a trench box, shielding, shoring, or other Professional Engineer designed system and using a sloping or benching system, soil classification cannot be Solid Rock or Type A. All soil will be classified as Type B or Type C and sloped or benched in accordance with Appendix B of 29 CFR 1926.

#### 1.43 CRANES

- A. All crane work shall comply with 29 CFR 1926 Subpart CC.
- B. Prior to operating a crane, the operator must be licensed, qualified or certified to operate the crane. Thus, all the provisions contained with Subpart CC are effective and there is no "Phase In" date of November 10, 2014.
- C. A detailed lift permit shall be submitted 14 days prior to the scheduled lift complete with route for truck carrying load, crane load analysis, siting of crane and path of swing. The lift will not be allowed without approval of this document.
- D. Crane operators shall not carry loads
1. over the general public or VAMC personnel
  2. over any occupied building unless
    - i. the top two floors are vacated
    - ii. or overhead protection with a design live load of 300 psf is provided

#### 1.44 CONTROL OF HAZARDOUS ENERGY (LOCKOUT/TAGOUT)

- A. All installation, maintenance, and servicing of equipment or machinery shall comply with 29 CFR 1910.147 except for specifically referenced operations in 29 CFR 1926 such as concrete & masonry equipment [1926.702(j)], heavy machinery & equipment [1926.600(a)(3)(i)], and process safety management of highly hazardous chemicals (1926.64). Control of hazardous electrical energy during the installation, maintenance, or servicing of electrical equipment shall comply with

Section 1.15 to include NFPA 70E and other VA specific requirements discussed in the section.

#### 1.45 CONFINED SPACE ENTRY

- A. All confined space entry shall comply with 29 CFR 1910.146 except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches [1926.651(g)].
- B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the Project Manager.

#### 1.46 WELDING AND CUTTING

- A. As specified in section 1.14, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Facility Safety Manager. Obtain permits from Facility Safety Manager at least 72 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.

#### 1.47 LADDERS

- A. All Ladder use shall comply with 29 CFR 1926 Subpart X.
- B. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.
- C. Manufacturer safety labels shall be in place on ladders
- D. Step Ladders shall not be used in the closed position
- E. Top steps or cap of step ladders shall not be used as a step
- F. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.
  - 1. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
  - 2. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.

- G. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "**DO NOT USE**," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

#### 1.48 FLOOR & WALL OPENINGS

- A. All floor and wall openings shall comply with 29 CFR 1926 Subpart M.
- B. Floor and roof holes/openings are any that measure over 2 in (51 mm) in any direction of a walking/working surface which persons may trip or fall into or where objects may fall to the level below. See 21.F for covering and labeling requirements. ***Skylights located in floors or roofs are considered floor or roof hole/openings.***
- C. All floor, roof openings or hole into which a person can accidentally walk or fall through shall be guarded either by a railing system with toeboards along all exposed sides or a load-bearing cover. When the cover is not in place, the opening or hole shall be protected by a removable guardrail system or shall be attended when the guarding system has been removed or other fall protection system.
  - 1. Covers shall be capable of supporting, without failure, at least twice the weight of the worker, equipment and material combined.
  - 2. Covers shall be secured when installed, clearly marked with the word "HOLE", "COVER" or "Danger, Roof Opening-Do Not Remove" or color-coded or equivalent methods (e.g., red or orange "X"). Workers must be made aware of the meaning for color coding and equivalent methods.
  - 3. Roofing material, such as roofing membrane, insulation or felts, covering or partly covering openings or holes, shall be immediately cut out. No hole or opening shall be left unattended unless covered.
  - 4. Non-load-bearing skylights shall be guarded by a load-bearing skylight screen, cover, or railing system along all exposed sides.

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**SECTION 01 42 19**  
**REFERENCE STANDARDS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

This section specifies the availability and source of references and standards specified in the project manual under paragraphs APPLICABLE PUBLICATIONS and/or shown on the drawings.

**1.2 AVAILABILITY OF SPECIFICATIONS**

The specifications and standards cited in this solicitation can be examined at the VA's website under **Office of Construction & Facilities Management**, at <http://www.cfm.va.gov/til/spec.asp>

or at the following location:

DEPARTMENT OF VETERANS AFFAIRS  
 Office of Construction & Facilities Management  
 Facilities Quality Service (00CFM1A)  
 425 Eye Street N.W, (sixth floor)  
 Washington, DC 20001  
 Telephone Numbers: (202) 632-5249 or (202) 632-5178  
 Between 9:00 AM - 3:00 PM

**1.4 AVAILABILITY OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-3) (JUN 1988)**

The specifications cited in this solicitation may be obtained from the associations or organizations listed below.

AA	Aluminum Association Inc. <a href="http://www.aluminum.org">http://www.aluminum.org</a>
AABC	Associated Air Balance Council <a href="http://www.aabchq.com">http://www.aabchq.com</a>
AAMA	American Architectural Manufacturer's Association <a href="http://www.aamanet.org">http://www.aamanet.org</a>
AAN	American Nursery and Landscape Association <a href="http://www.anla.org">http://www.anla.org</a>
AATCC	American Association of Textile Chemists and Colorists <a href="http://www.aatcc.org">http://www.aatcc.org</a>
ACGIH	American Conference of Governmental Industrial Hygienists <a href="http://www.acgi.org">http://www.acgi.org</a>
ACI	American Concrete Institute <a href="http://www.aci-int.net">http://www.aci-int.net</a>
ACPA	American Concrete Pipe Association <a href="http://www.concrete-pipe.org">http://www.concrete-pipe.org</a>

ACPPA	American Concrete Pressure Pipe Association <a href="http://www.acppa.org">http://www.acppa.org</a>
ADC	Air Diffusion Council <a href="http://flexibleduct.org">http://flexibleduct.org</a>
AGA	American Gas Association <a href="http://www.aga.org">http://www.aga.org</a>
AGC	Associated General Contractors of America <a href="http://www.agc.org">http://www.agc.org</a>
AGMA	American Gear Manufacturers Association, Inc. <a href="http://www.agma.org">http://www.agma.org</a>
AHAM	Association of Home Appliance Manufacturers <a href="http://www.aham.org">http://www.aham.org</a>
AISC	American Institute of Steel Construction <a href="http://www.aisc.org">http://www.aisc.org</a>
AISI	American Iron and Steel Institute <a href="http://www.steel.org">http://www.steel.org</a>
AITC	American Institute of Timber Construction <a href="http://www.aitc-glulam.org">http://www.aitc-glulam.org</a>
AMCA	Air Movement and Control Association, Inc. <a href="http://www.amca.org">http://www.amca.org</a>
ANLA	American Nursery & Landscape Association <a href="http://www.anla.org">http://www.anla.org</a>
ANSI	American National Standards Institute, Inc. <a href="http://www.ansi.org">http://www.ansi.org</a>
APA	The Engineered Wood Association <a href="http://www.apawood.org">http://www.apawood.org</a>
ARI	Air-Conditioning and Refrigeration Institute <a href="http://www.ari.org">http://www.ari.org</a>
ASAE	American Society of Agricultural Engineers <a href="http://www.asae.org">http://www.asae.org</a>
ASCE	American Society of Civil Engineers <a href="http://www.asce.org">http://www.asce.org</a>
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers <a href="http://www.ashrae.org">http://www.ashrae.org</a>
ASME	American Society of Mechanical Engineers <a href="http://www.asme.org">http://www.asme.org</a>
ASSE	American Society of Sanitary Engineering <a href="http://www.asse-plumbing.org">http://www.asse-plumbing.org</a>
ASTM	American Society for Testing and Materials <a href="http://www.astm.org">http://www.astm.org</a>



AWI	Architectural Woodwork Institute <a href="http://www.awinet.org">http://www.awinet.org</a>
AWS	American Welding Society <a href="http://www.aws.org">http://www.aws.org</a>
AWWA	American Water Works Association <a href="http://www.awwa.org">http://www.awwa.org</a>
BHMA	Builders Hardware Manufacturers Association <a href="http://www.buildershardware.com">http://www.buildershardware.com</a>
BIA	Brick Institute of America <a href="http://www.bia.org">http://www.bia.org</a>
CAGI	Compressed Air and Gas Institute <a href="http://www.cagi.org">http://www.cagi.org</a>
CGA	Compressed Gas Association, Inc. <a href="http://www.cganet.com">http://www.cganet.com</a>
CI	The Chlorine Institute, Inc. <a href="http://www.chlorineinstitute.org">http://www.chlorineinstitute.org</a>
CISCA	Ceilings and Interior Systems Construction Association <a href="http://www.cisca.org">http://www.cisca.org</a>
CISPI	Cast Iron Soil Pipe Institute <a href="http://www.cispi.org">http://www.cispi.org</a>
CLFMI	Chain Link Fence Manufacturers Institute <a href="http://www.chainlinkinfo.org">http://www.chainlinkinfo.org</a>
CPMB	Concrete Plant Manufacturers Bureau <a href="http://www.cpmc.org">http://www.cpmc.org</a>
CRSI	Concrete Reinforcing Steel Institute <a href="http://www.crsi.org">http://www.crsi.org</a>
CTI	Cooling Technology Institute <a href="http://www.cti.org">http://www.cti.org</a>
DHI	Door and Hardware Institute <a href="http://www.dhi.org">http://www.dhi.org</a>
EGSA	Electrical Generating Systems Association <a href="http://www.egsa.org">http://www.egsa.org</a>
EEI	Edison Electric Institute <a href="http://www.eei.org">http://www.eei.org</a>
EPA	Environmental Protection Agency <a href="http://www.epa.gov">http://www.epa.gov</a>
ETL	ETL Testing Laboratories, Inc. <a href="http://www.etl.com">http://www.etl.com</a>
FAA	Federal Aviation Administration <a href="http://www.faa.gov">http://www.faa.gov</a>

FCC	Federal Communications Commission <a href="http://www.fcc.gov">http://www.fcc.gov</a>
FPS	The Forest Products Society <a href="http://www.forestprod.org">http://www.forestprod.org</a>
GANA	Glass Association of North America <a href="http://www.cssinfo.com/info/gana.html/">http://www.cssinfo.com/info/gana.html/</a>
FM	Factory Mutual Insurance <a href="http://www.fmglobal.com">http://www.fmglobal.com</a>
GA	Gypsum Association <a href="http://www.gypsum.org">http://www.gypsum.org</a>
GSA	General Services Administration <a href="http://www.gsa.gov">http://www.gsa.gov</a>
HI	Hydraulic Institute <a href="http://www.pumps.org">http://www.pumps.org</a>
HPVA	Hardwood Plywood & Veneer Association <a href="http://www.hpva.org">http://www.hpva.org</a>
ICBO	International Conference of Building Officials <a href="http://www.icbo.org">http://www.icbo.org</a>
ICEA	Insulated Cable Engineers Association Inc. <a href="http://www.icea.net">http://www.icea.net</a>
\ICAC	Institute of Clean Air Companies <a href="http://www.icac.com">http://www.icac.com</a>
IEEE	Institute of Electrical and Electronics Engineers <a href="http://www.ieee.org/">http://www.ieee.org/</a>
IMSA	International Municipal Signal Association <a href="http://www.imsasafety.org">http://www.imsasafety.org</a>
IPCEA	Insulated Power Cable Engineers Association
NBMA	Metal Buildings Manufacturers Association <a href="http://www.mbma.com">http://www.mbma.com</a>
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry Inc. <a href="http://www.mss-hq.com">http://www.mss-hq.com</a>
NAAMM	National Association of Architectural Metal Manufacturers <a href="http://www.naamm.org">http://www.naamm.org</a>
NAPHCC	Plumbing-Heating-Cooling Contractors Association <a href="http://www.phccweb.org.org">http://www.phccweb.org.org</a>
NBS	National Bureau of Standards See - NIST
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors <a href="http://www.nationboard.org">http://www.nationboard.org</a>

NEC National Electric Code  
 See - NFPA National Fire Protection Association  
 NEMA National Electrical Manufacturers Association  
<http://www.nema.org>  
 NFPA National Fire Protection Association  
<http://www.nfpa.org>  
 NIH National Institute of Health  
<http://www.nih.gov>  
 NIST National Institute of Standards and Technology  
<http://www.nist.gov>  
 NLMA Northeastern Lumber Manufacturers Association, Inc.  
<http://www.nelma.org>  
 NPA National Particleboard Association  
 18928 Premiere Court  
 Gaithersburg, MD 20879  
 (301) 670-0604  
 NSF National Sanitation Foundation  
<http://www.nsf.org>  
 NWWDA Window and Door Manufacturers Association  
<http://www.nwwda.org>  
 OSHA Occupational Safety and Health Administration  
 Department of Labor  
<http://www.osha.gov>  
 PCA Portland Cement Association  
<http://www.portcement.org>  
 PCI Precast Prestressed Concrete Institute  
<http://www.pci.org>  
 PPI The Plastic Pipe Institute  
<http://www.plasticpipe.org>  
 PEI Porcelain Enamel Institute, Inc.  
<http://www.porcelainenamel.com>  
 PTI Post-Tensioning Institute  
<http://www.post-tensioning.org>  
 RFCI The Resilient Floor Covering Institute  
<http://www.rfci.com>  
 RMA Rubber Manufacturers Association, Inc.  
<http://www.rma.org>  
 SCMA Southern Cypress Manufacturers Association  
<http://www.cypressinfo.org>  
 SDI Steel Door Institute  
<http://www.steeldoor.org>

IGMA Insulating Glass Manufacturers Alliance  
<http://www.igmaonline.org>

SJI Steel Joist Institute  
<http://www.steeljoist.org>

SMACNA Sheet Metal and Air-Conditioning Contractors  
 National Association, Inc.  
<http://www.smacna.org>

SSPC The Society for Protective Coatings  
<http://www.sspc.org>

STI Steel Tank Institute  
<http://www.steeltank.com>

SWI Steel Window Institute  
<http://www.steelwindows.com>

TCA Tile Council of America, Inc.  
<http://www.tileusa.com>

TEMA Tubular Exchange Manufacturers Association  
<http://www.tema.org>

TPI Truss Plate Institute, Inc.  
 583 D'Onofrio Drive; Suite 200  
 Madison, WI 53719  
 (608) 833-5900

UBC The Uniform Building Code  
 See ICBO

UL Underwriters' Laboratories Incorporated  
<http://www.ul.com>

ULC Underwriters' Laboratories of Canada  
<http://www.ulc.ca>

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**SECTION 01 57 19**  
**TEMPORARY ENVIRONMENTAL CONTROLS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies the control of environmental pollution and damage that the Contractor must consider for air, water, and land resources. It includes management of visual aesthetics, noise, solid waste, radiant energy, and radioactive materials, as well as other pollutants and resources encountered or generated by the Contractor. The Contractor is obligated to consider specified control measures with the costs included within the various contract items of work.
- B. Environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which:
  - 1. Adversely effect human health or welfare,
  - 2. Unfavorably alter ecological balances of importance to human life,
  - 3. Effect other species of importance to humankind, or;
  - 4. Degrade the utility of the environment for aesthetic, cultural, and historical purposes.
- C. Definitions of Pollutants:
  - 1. Chemical Waste: Petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals, and inorganic wastes.
  - 2. Debris: Combustible and noncombustible wastes, such as leaves, tree trimmings, ashes, and waste materials resulting from construction or maintenance and repair work.
  - 3. Sediment: Soil and other debris that has been eroded and transported by runoff water.
  - 4. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from industrial, commercial, and agricultural operations and from community activities.
  - 5. Surface Discharge: The term "Surface Discharge" implies that the water is discharged with possible sheeting action and subsequent soil erosion may occur. Waters that are surface discharged may terminate in drainage ditches, storm sewers, creeks, and/or "water of the United States" and would require a permit to discharge water from the governing agency.
  - 6. Rubbish: Combustible and noncombustible wastes such as paper, boxes, glass and crockery, metal and lumber scrap, tin cans, and bones.

7. Sanitary Wastes:

- a. Sewage: Domestic sanitary sewage and human and animal waste.
- b. Garbage: Refuse and scraps resulting from preparation, cooking, dispensing, and consumption of food.

**1.2 QUALITY CONTROL**

- A. Establish and maintain quality control for the environmental protection of all items set forth herein.
- B. Record on daily reports any problems in complying with laws, regulations, and ordinances. Note any corrective action taken.

**1.3 REFERENCES**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.
- B. U.S. National Archives and Records Administration (NARA):  
33 CFR 328.....Definitions

**1.4 SUBMITTALS**

- A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:
  - 1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the COR to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the COR for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
    - a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
    - b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.
    - c. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
    - d. Description of the Contractor's environmental protection personnel training program.
    - e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.

- f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.
  - g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.
  - h. Permits, licenses, and the location of the solid waste disposal area.
  - i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.
  - j. Environmental Monitoring Plans for the job site including land, water, air, and noise.
  - k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.
- B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

#### **1.5 PROTECTION OF ENVIRONMENTAL RESOURCES**

- A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.
  - B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the COR. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.
1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence

- isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
    - a. Box and protect from damage existing trees and shrubs to remain on the construction site.
    - b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
    - c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
  3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use. Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.
  6. Manage borrow areas on Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
  7. Manage and control spoil areas on Government property to limit spoil to areas on the Environmental Protection Plan and prevent erosion of soil or sediment from entering nearby water courses or lakes.
  8. Protect adjacent areas from despoilment by temporary excavations and embankments.
  9. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.
  10. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
  11. Handle discarded materials other than those included in the solid waste category as directed by the COR.
- C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to



control water pollution by the listed construction activities that are included in this contract.

1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
  2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
  3. Monitor water areas affected by construction.
- D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection.
- E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Tennessee - Air Pollution Control Requirements and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.
1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.
  2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.
  3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.

4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.

F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the COR. Maintain noise-produced work at or below the decibel levels and within the time periods specified.

1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 6:00 p.m unless otherwise permitted by local ordinance or the COR. Repetitive impact noise on the property shall not exceed the following dB limitations:

Time Duration of Impact Noise	Sound Level in dB
More than 12 minutes in any hour	70
Less than 30 seconds of any hour	85
Less than three minutes of any hour	80
Less than 12 minutes of any hour	75

2. Provide sound-deadening devices on equipment and take noise abatement measures that are necessary to comply with the requirements of this contract, consisting of, but not limited to, the following:

a. Maintain maximum permissible construction equipment noise levels at 15 m (50 feet) (dBA):

EARTHMOVING		MATERIALS HANDLING	
FRONT LOADERS	75	CONCRETE MIXERS	75
BACKHOES	75	CONCRETE PUMPS	75
DOZERS	75	CRANES	75
TRACTORS	75	DERRICKS IMPACT	75
SCAPERS	80	PILE DRIVERS	95
GRADERS	75	JACK HAMMERS	75
TRUCKS	75	ROCK DRILLS	80
PAVERS, STATIONARY	80	PNEUMATIC TOOLS	80
PUMPS	75	BLASTING	NA
GENERATORS	75	SAWS	75
COMPRESSORS	75	VIBRATORS	75

b. Use shields or other physical barriers to restrict noise transmission.

c. Provide soundproof housings or enclosures for noise-producing machinery.

d. Use efficient silencers on equipment air intakes.

- e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.
  - f. Line hoppers and storage bins with sound deadening material.
  - g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.
3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 50 feet from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the effect of reflective sound waves at buildings, take measurements at three to six feet in front of any building face. Submit the recorded information to the COR noting any problems and the alternatives for mitigating actions.
- G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.
- H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the COR. Cleaning shall include off the station disposal of all items and materials not required to be salvaged, as well as all debris and rubbish resulting from demolition and new work operations.

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**SECTION 01 58 16**  
**TEMPORARY INTERIOR SIGNAGE**

**PART 1 GENERAL**

**DESCRIPTION**

This section specifies temporary interior signs.

**PART 2 PRODUCTS**

**2.1 TEMPORARY SIGNS**

- A. Fabricate from 110 pound mat finish white paper.
- B. Cut to 4-inch wide by 12 inch long size tag.
- C. Punch 1/8-inch diameter hole centered on 4-inch dimension of tag. Edge of Hole spaced approximately (1/2-inch) from one end on tag.
- D. Reinforce hole on both sides with gummed cloth washer or other suitable material capable of preventing tie pulling through paper edge.
- E. Ties: Steel wire 0.0120-inch thick, attach to tag with twist tie, leaving 6-inch long free ends.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- A. Install temporary signs attached to room door frame or room door knob, lever, or pull for doors on corridor openings.
- B. Mark on signs with felt tip marker having approximately 1/8-inch wide stroke for clearly legible numbers or letters.
- C. Identify room with numbers as designated on floor plans.

**3.2 LOCATION**

- A. Install on doors that have room, corridor, and space numbers shown.
- B. Doors that do not require signs are as follows:
  - 1. Corridor barrier doors (cross-corridor) in corridor with same number.
  - 2. Folding doors or partitions.
  - 3. Toilet or bathroom doors within and between rooms.
  - 4. Communicating doors in partitions between rooms with corridor entrance doors.
  - 5. Closet doors within rooms.
- C. Replace missing, damaged, or illegible signs.

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**SECTION 01 74 19**  
**CONSTRUCTION WASTE MANAGEMENT**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies the requirements for the management of non-hazardous building construction and demolition waste.
- B. Waste disposal in landfills shall be minimized to the greatest extent possible. Of the inevitable waste that is generated, as much of the waste material as economically feasible shall be salvaged, recycled or reused.
- C. Contractor shall use all reasonable means to divert construction and demolition waste from landfills and incinerators, and facilitate their salvage and recycle not limited to the following:
  - 1. Waste Management Plan development and implementation.
  - 2. Techniques to minimize waste generation.
  - 3. Sorting and separating of waste materials.
  - 4. Recycling of materials that cannot be reused or sold.
- D. At a minimum the following waste categories shall be diverted from landfills:
  - 1. Soil.
  - 2. Inerts (eg, concrete, masonry and asphalt).
  - 3. Clean dimensional wood and palette wood.
  - 4. Green waste (biodegradable landscaping materials).
  - 5. Engineered wood products (plywood, particle board and I-joists, etc).
  - 6. Metal products (eg, steel, wire, beverage containers, copper, etc).
  - 7. Cardboard, paper and packaging.
  - 8. Bitumen roofing materials.
  - 9. Plastics (eg, ABS, PVC).
  - 10. Carpet and/or pad.
  - 11. Gypsum board.
  - 12. Insulation.
  - 13. Paint.
  - 14. Fluorescent lamps.

**1.2 RELATED WORK**

- A. Section 02 41 00, DEMOLITION.
- B. Section 01 00 00, GENERAL REQUIREMENTS.

### 1.3 QUALITY ASSURANCE

- A. Contractor shall practice efficient waste management when sizing, cutting and installing building products. Processes shall be employed to ensure the generation of as little waste as possible.
- B. Establish and maintain the management of non-hazardous building construction and demolition waste set forth herein. Conduct a site assessment to estimate the types of materials that will be generated by demolition and construction.
- C. Contractor shall develop and implement procedures to recycle construction and demolition waste to a minimum of 50 percent.
- D. Contractor shall be responsible for implementation of any special programs involving rebates or similar incentives related to recycling. Any revenues or savings obtained from salvage or recycling shall accrue to the contractor.
- E. Contractor shall provide all demolition, removal and legal disposal of materials. Contractor shall ensure that facilities used for recycling, reuse and disposal shall be permitted for the intended use to the extent required by local, state, federal regulations. The Whole Building Design Guide website <http://www.wbdg.org/tools/cwm.php> provides a Construction Waste Management Database that contains information on companies that haul, collect, and process recyclable debris from construction projects.
- F. Contractor shall assign a specific area to facilitate separation of materials for reuse, salvage, recycling, and return. Such areas are to be kept neat and clean and clearly marked in order to avoid contamination or mixing of materials.
- G. Contractor shall provide on-site instructions and supervision of separation, handling, salvaging, recycling, reuse and return methods to be used by all parties during waste generating stages.
- H. Record on daily reports any problems in complying with laws, regulations and ordinances with corrective action taken.

### 1.4 TERMINOLOGY

- A. Class III Landfill: A landfill that accepts non-hazardous resources such as household, commercial and industrial waste resulting from construction, remodeling, repair and demolition operations.
- B. Clean: Untreated and unpainted; uncontaminated with adhesives, oils, solvents, mastics and like products.



- C. Construction and Demolition Waste: Includes all non-hazardous resources resulting from construction, remodeling, alterations, repair and demolition operations.
- D. Dismantle: The process of parting out a building in such a way as to preserve the usefulness of its materials and components.
- E. Disposal: Acceptance of solid wastes at a legally operating facility for the purpose of land filling (includes Class III landfills and inert fills).
- F. Inert Backfill Site: A location, other than inert fill or other disposal facility, to which inert materials are taken for the purpose of filling an excavation, shoring or other soil engineering operation.
- G. Inert Fill: A facility that can legally accept inert waste, such as asphalt and concrete exclusively for the purpose of disposal.
- H. Inert Solids/Inert Waste: Non-liquid solid resources including, but not limited to, soil and concrete that does not contain hazardous waste or soluble pollutants at concentrations in excess of water-quality objectives established by a regional water board, and does not contain significant quantities of decomposable solid resources.
- I. Mixed Debris: Loads that include commingled recyclable and non-recyclable materials generated at the construction site.
- J. Mixed Debris Recycling Facility: A solid resource processing facility that accepts loads of mixed construction and demolition debris for the purpose of recovering re-usable and recyclable materials and disposing non-recyclable materials.
- K. Permitted Waste Hauler: A company that holds a valid permit to collect and transport solid wastes from individuals or businesses for the purpose of recycling or disposal.
- L. Recycling: The process of sorting, cleansing, treating, and reconstituting materials for the purpose of using the altered form in the manufacture of a new product. Recycling does not include burning, incinerating or thermally destroying solid waste.
  - 1. On-site Recycling - Materials that are sorted and processed on site for use in an altered state in the work, i.e. concrete crushed for use as a sub-base in paving.
  - 2. Off-site Recycling - Materials hauled to a location and used in an altered form in the manufacture of new products.
- M. Recycling Facility: An operation that can legally accept materials for the purpose of processing the materials into an altered form for the manufacture of new products. Depending on the types of materials

accepted and operating procedures, a recycling facility may or may not be required to have a solid waste facilities permit or be regulated by the local enforcement agency.

- N. Reuse: Materials that are recovered for use in the same form, on-site or off-site.
- O. Return: To give back reusable items or unused products to vendors for credit.
- P. Salvage: To remove waste materials from the site for resale or re-use by a third party.
- Q. Source-Separated Materials: Materials that are sorted by type at the site for the purpose of reuse and recycling.
- R. Solid Waste: Materials that have been designated as non-recyclable and are discarded for the purposes of disposal.
- S. Transfer Station: A facility that can legally accept solid waste for the purpose of temporarily storing the materials for re-loading onto other trucks and transporting them to a landfill for disposal, or recovering some materials for re-use or recycling.

#### **1.5 SUBMITTALS - NONE REQUIRED.**

#### **1.6 APPLICABLE PUBLICATIONS**

- A Publications listed below form a part of this specification to the extent referenced. Publications are referenced by the basic designation only. In the event that criteria requirements conflict, the most stringent requirements shall be met.
- B. U.S. Green Building Council (USGBC):  
LEED Green Building Rating System for New Construction

#### **1.7 RECORDS**

Maintain records to document the estimated quantity of waste generated; the estimated quantity of waste diverted through sale, reuse, or recycling; and the estimated quantity of waste disposed by landfill or incineration.

#### **PART 2 - PRODUCTS - PART 2 PARAGRAPH DELETED.**

#### **PART 3 - EXECUTION**

##### **3.1 COLLECTION**

- A. Provide all necessary containers, bins and storage areas to facilitate effective waste management.
- B. Clearly identify containers, bins and storage areas so that recyclable materials are separated from trash and can be transported to respective recycling facility for processing.

- C. Hazardous wastes shall be separated, stored, disposed of according to local, state, federal regulations.

### **3.2 DISPOSAL**

- A. Contractor shall be responsible for transporting and disposing of materials that cannot be delivered to a source-separated or mixed materials recycling facility to a transfer station or disposal facility that can accept the materials in accordance with state and federal regulations.
- B. Construction or demolition materials with no practical reuse or that cannot be salvaged or recycled shall be disposed of at a landfill or incinerator.

### **3.3 REPORT**

- A. With each application for progress payment, submit a summary of construction and demolition debris diversion and disposal including beginning and ending dates of period covered.
- B. Quantify all materials diverted from landfill disposal through salvage or recycling during the period with the receiving parties.
- C. Quantify all materials disposed of during the period. Include the net total costs for each disposal.

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**SECTION 02 41 00  
DEMOLITION**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies demolition and removal of portions of buildings, mechanical and electrical items, and debris.
  - 1. Contractor shall be responsible for all demolition required to complete the finished work as defined within the Contract Documents.
  - 2. Existing construction to be removed:
    - a. Contractor shall remove all construction designated and/or shown to be removed to receive new work as herein indicated completely.
    - b. Fire protection, plumbing, mechanical, and electrical trades shall remove all devices and items pertaining to their respective trades from all existing partitions, ceilings, and the like being removed. Coordinate demolition with concurrent general demolition. Unless noted to be abandoned, fire protection, plumbing, mechanical and electrical items that pass through or are affected by the demolition shall be maintained in a complete and fully operational condition or, where noted, be appropriately capped off. Provide temporary systems as required to maintain full operation outside the area of demolition for any and all systems.

**1.2 RELATED WORK:**

- A. Safety Requirements: Section 01 35 26 Safety Requirements Article, ACCIDENT PREVENTION PLAN (APP).
- V. Disconnecting mechanical and electrical services prior to demolition: Section 01 00 00, GENERAL REQUIREMENTS.
- C. Reserved items that are to remain the property of the Government: Section 01 00 00, GENERAL REQUIREMENTS.
- D. Construction Waste Management: Section 017419 CONSTRUCTION WASTE MANAGEMENT.
- E. Infectious Control: Section 01 00 00, GENERAL REQUIREMENTS, Article 1.7, INFECTION PREVENTION MEASURES.
- F. Firestopping: Section 07 84 00, FIRESTOPPING.
  - 1. If during the course of construction, missing and/or damaged fireproofing is observed on the existing structure, replace it to match the existing fireresistance rating for the structural component.

2. Openings in fireresistance-rated/smoke walls shall be closed with an appropriate firestopping system. For openings left as a result of conduit and/ or cable removal, repair as necessary to match existing wall construction.

### 1.3 PROTECTION:

- A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, mechanical and electrical items, and structures or interruption of use of such mechanical and electrical items; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article, ACCIDENT PREVENTION.
  1. Perform demolition work with "due care and diligence" so as to prevent the arbitrary destruction or interruption of concealed utilities which are intended to remain in use and the routing of which could not be predetermined until demolition was started. All such discoveries of utilities during the demolition process which are in a location different from that indicated, change direction from floor to floor, and the like, or are unidentified shall be reported to the COR before removal.
- B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations. Comply with requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES AND IMPROVEMENTS.
- C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.
- D. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable condition such as, but not limited to; ice, flooding, or pollution. Vacuum and dust the work area daily.
- E. In addition to previously listed fire and safety rules to be observed in performance of work, include following:
  1. No wall or part of wall shall be permitted to fall outwardly from structures.
  2. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for

immediate use. Instruct all possible users in use of fire extinguishers.

3. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 4500 mm (15 feet) of fire hydrants.

F. Before beginning any demolition work, the Contractor shall survey the site and examine the Drawings and Specifications to determine the extent of the Work. The Contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Medical Center; any damaged items shall be repaired or replaced as approved by the COR. The Contractor shall coordinate the work of this Section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this Contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have COR's approval.

1. See Drawings for extent of cutting and patching requirements necessitated by each portion of the Work, such as structural, fire protection, plumbing, mechanical, electrical, and vendor equipment drawings (and the like).
2. See structural, fire protection, plumbing, mechanical, electrical, and vendor equipment drawings for additional work that may require ceiling access for special systems such as smoke/fire alarm, random junction boxes, and the like, which have not been indicated on the reflected ceiling or demolition plans. Indicate this work on the Coordination Drawings.

G. The work shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

H. The work shall comply with the requirements of Section 01 00 00, GENERAL REQUIREMENTS, Article 1.7 INFECTION PREVENTION MEASURES.

**1.4 UTILITY SERVICES (NOT USED)****PART 2 - PRODUCTS (NOT USED)****PART 3 - EXECUTION****3.0 EXAMINATION**

- A. In areas requiring new work and patching, verify existing finishes shown on the room finish information drawings and/or schedule. Immediately call any discrepancies to the COR's attention. New floor, base, wainscot, wall, and ceiling finishes shall match the existing finishes, unless otherwise noted.
1. Refer to the room finish information drawings and/or schedule for additional information concerning finishes which impact the work.
  2. For existing ceiling patching, where ceiling is cut out or portions removed for removal of existing devices or installation of new work, the disturbed portion shall be patched to match the existing ceiling finish. Unless otherwise noted, the entire ceiling area is to be repainted where ceilings are gypsum board or plaster.
  3. Where new finishes are applied to existing, the existing finishes shall be removed and/or the existing surfaces prepared as required to receive new finishes, unless otherwise noted. Where required to accommodate the new finishes, the mechanical, plumbing, and electrical trades shall disconnect and remove their respective devices and items from the existing wall, ceiling and/or floor and relocate to their final position in the new construction. Such devices shall include but not be limited to electrical switches, panels, outlets, thermostats, grills, plumbing fixtures, medical gas outlets, and the like. The respective trade shall also be responsible for any permanent connections of those items which are relocated.
  4. In areas that have an existing flush floor finish of quarry tile or ceramic tile and are noted to receive a resilient floor tile or sheet vinyl finish, the ceramic/quarry tile shall be removed along with any loose setting bed material, and the area shall be leveled with self-leveling cement-based underlayment in preparation for the new finish.
  5. In areas that have an existing floor finish of resilient floor tile or carpet and are to receive a new ceramic tile floor, the flooring and adhesive shall be removed in preparation for such new hard tile.



6. When carpet is to be removed it shall be wetted with an USEPA- and Owner-approved germicidal agent prior to the removal of the carpet to prevent the dispersion of airborne particles.
7. Plaster walls in an existing building that are to receive ceramic wall tile shall have the plaster removed from existing walls to the height of the new ceramic wall tile in preparation for the new setting bed and cement board shall be installed and prepared in accordance with the manufacturer's written instructions.
8. Plaster or gypsum wallboard walls in an existing building from which vinyl wall fabric is removed, shall be cleaned of all adhesive and a skim coat of plaster shall be applied to receive the new finish.
9. In rooms scheduled to receive new finishes or millwork that is to receive new finishes, existing fixtures, devices, hardware, and accessories shall be temporarily removed as required to allow the new finish to extend under or behind the fixture or accessory and then reset.

### **3.1 DEMOLITION:**

- A. Debris, including concrete, metals, and similar materials shall become property of Contractor and shall be disposed of by him daily, off the Medical Center to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the COR. Contractor shall dispose of debris in compliance with applicable federal, state or local permits, rules, and/or regulations.
- B. Remove and legally dispose of all materials, other than earth to remain as part of project work. Materials removed shall become property of Contractor and shall be disposed of in compliance with applicable federal, state or local permits, rules, and/or regulations . The removal of hazardous material shall be abated by a licensed abatement contractor under an allowance, with Hazardous Materials specifications negotiated separately with the Owner.
  1. Exception: Televisions, monitors by Philips, Essentris dialysis boxes by Clinicom, patient lifts, fire extinguisher systems, and emergency chair evacuation systems shall be turned over to the Owner and stored where directed. Items that the Owner does not want to keep shall be removed and properly disposed of by the Contractor.
  2. Remove portions of existing construction as designated and/or shown and patch remaining surfaces to match the adjacent construction.

3. Where indicated, remove existing door and frame and seal wall opening with construction to match the adjacent wall, unless otherwise noted. Finish wall to match the adjacent finish or to receive new finishes as scheduled.
  4. Where indicated, remove existing window and seal opening with wall construction to match the adjacent wall, unless noted otherwise. Finish wall to match the adjacent finish or to receive new finishes as scheduled.
  5. Remove existing cabinetwork as indicated. Where there is plumbing involved, such plumbing shall be removed and at a minimum, shall be capped off in the wall or below the floor such that the wall or floor surface can be patched flush to match adjacent surfaces or to receive new finishes scheduled. See notes on plumbing drawings for more information.
- E. Remove existing mechanical and electrical items as indicated or uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific mechanical and electrical item and approved by the COR. When mechanical and electrical lines are encountered that are not indicated on the drawings, the COR shall be notified prior to further work in that area.
1. Whenever existing equipment, piping, ducts, and the like, are required to be removed, such removal shall include all anchors, hangers, foundations, and the like. After removal, any affected construction and surfaces such as floors, walls, bases, and ceilings shall be finished to match adjacent surfaces, unless otherwise noted.
  2. Conduit should be removed back to the panel of origin if not used, unless used to feed other area. Unused conductors shall be removed back to the panel.
    - a. Exception: Conduit stubs abandoned-in-place due to the nature of the existing structural shall be capped and/or plugged with an appropriately used device or approved firestopping system.
  3. Remove abandoned electrical wire and/ or cables back to their point of origin. Data cable shall be pulled back to the data room of origin by the Contractor. Facility IT personnel shall disconnect cables from operational network equipment. Coordinate with facilities staff.

4. Completed runs of empty electrical conduits designated as "spare" shall not be removed.

**3.2 CLEAN-UP:**

- A. On completion of work of this Section and after removal of all debris, leave Project site in clean condition satisfactory to COR. Clean-up shall include disposal of all items and materials not required to remain property of the Government as well as all debris and rubbish resulting from demolition operations.
  1. Existing areas, whether within or outside the limits of the Contract, shall be repaired where any damage has occurred due to construction.

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**SECTION 04 73 00**  
**MANUFACTURED STONE**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Manufactured simulated stone veneers for interior applications with mortar joints between stones.
- B. Reinforcement, anchorages, lath, mortar, and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 92 00 - Joint Sealants.
- B. Section 09 21 16 - Gypsum Board Assemblies: Backer board.
- C. Section 09 22 16 - Non-Structural Metal Framing: Wall framing.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit for fabricated wire reinforcement and each type of stone specified. Include all applicable physical and performance data. Include:
  - 1. Construction details.
  - 2. Material descriptions.
  - 3. Dimensions of individual components and profiles.
  - 4. Finishes.
- C. Shop Drawings: Show fabrication and installation details.
  - 1. Include:
    - a. Dimensions.
    - b. Details of reinforcement and anchorages.
    - c. Indication of finished faces.
  - 2. Provide locations of special shapes, corners, and trim shapes.
  - 3. Include building elevations showing layout of units and locations of joints and anchors.
- D. Samples:
  - 1. Submit samples of simulated stone units illustrating color, texture, and size range of each type unit.
  - 2. Submit mortar samples showing the full range expected in the finished construction.
    - a. Make samples using the same sand and mortar ingredients to be used on Project.
    - b. Label samples to indicate type and amount of colorant used.
- E. Certificates: Certify requirements listed in Part-1 Article Quality Assurance.
- F. Evaluation Service Reports: Show compliance with specified requirements.
- G. Installer's Qualification Statement.
- H. Manufacturer's Instructions: Indicate detailed installation instructions.
- I. Manufacturer Qualifications: List of projects on which manufacturer has supplied simulated stone materials in the past five years.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing the Work of this Section with minimum five years of documented experience in

similar types of work of similar scope and able to furnish list of previous jobs and references if requested by COR.

**B. Certifications:**

1. Provide written documentation that stone products comply with specified minimum criteria when tested in accordance with testing standards specified in Part 2 of this Section.

**C. Mock-Up: Construct at the Project site a stone wall Mock-Up, in size required by COR, illustrating bonding, joint work, moisture barrier, expansion, control joints, and accessories.**

1. Locate where directed by COR.
2. Notify COR seven days in advance of dates and times when Mock-Up will be constructed.
3. Obtain COR's approval before beginning work.
  - a. Approval of Mock-Up is for color, texture, and blending of units; relationship of mortar and sealant colors to stone colors; tooling of joints; and aesthetic qualities of workmanship.
  - b. Approval of Mock-Up is also for other material and construction qualities specifically approved by COR in writing.
  - c. Approval of Mock-Up does not constitute approval of deviations from the Contract Documents contained in Mock-Up, unless such deviations are specifically approved by COR in writing.
4. Mason creating Mock-Up shall be retained to work on the Project.
5. Retain sample as a basis on which the quality of the work will be judged.
6. Protect accepted Mock-Up from the elements with weather-resistant membrane.
7. Do not remove until Substantial Completion.
8. Mock-Up may not remain as part of the Work. Demolish and remove Mock-Up when directed.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Pack, handle, and ship stone units in suitable packs or pallets.**
1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining.
- B. Store mortar materials on pallets in dry place under cover and elevated above grade.**
1. Protect materials from rain, moisture, and freezing temperatures.
  2. Protect reinforcement and accessories from elements.
  3. Arrange to distribute weight evenly and to prevent damage to units.
  4. Ventilate under covers to prevent condensation.

**1.06 FIELD CONDITIONS**

**A. Environmental Requirements:**

1. Minimum air temperature of 40 degrees Fahrenheit prior to, during, and for 48 hours after completion of work.
2. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the face of stone veneer assemblies.
  - a. Protect base of walls from mortar splatter by coverings spread over the wall surface.
  - b. Protect sills, ledges, and projections from mortar droppings.
  - c. Protect surfaces of products with painted and integral finishes from mortar droppings.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Source Limitations for Materials: Obtain materials from one manufacturer, from one source or producer, Veneerstone, distributed by Daltile.

**2.02 MATERIALS**

- A. Stone Materials:
  - 1. Simulated Stone:
    - a. Precast simulated stone, composed of the following materials:
      - 1) Portland Cement: ASTM C150, Type 1, 2, or 3 depending upon color to be produced.
      - 2) Course Aggregates: ASTM C330, lightweight type, color as necessary to obtain final approved color of stone.
      - 3) Sand: ASTM C144, special color if required to match approved sample.
      - 4) Iron oxide colors.
      - 5) Water: Clean and free from deleterious substances.
  - 2. Stone Accessories: Wall caps in size(s) as indicated on the Drawings.
- B. Mortar Materials:
  - 1. Cement: ASTM C150, Type I or masonry cement meeting ASTM C91.
  - 2. Masonry sand, complying with ASTM C144, natural or manufactured.
  - 3. Pigments: Meeting ASTM C979, mineral oxide type.
    - a. Mortar Color: Natural as manufactured by Coronado Stone Products
  - 4. Water: Potable.
  - 5. Mixing: Use thinset with acrylic additive in accordance with thinset manufacturer's recommendation.
    - a. Thoroughly mix mortar and grout ingredients in quantities needed for immediate use. Mix grout to ASTM C270, Type S proportions and mortar to requirements of ASTM C270, Type S.
- C. Related Materials: Setting Accessories.
  - 1. Metal Lath: ASTM C847; 18 gage, galvanized, flat diamond mesh, self-furring, stamped sheet; 2.5.
    - a. Attachment: Galvanized nails, screws and other metal supports, of type and size to suit applications; to rigidly secure materials in place.
  - 2. Joint Sealant: Refer to Section 07 92 00.
  - 3. Fasteners: Corrosion-resistant, self-drilling, self-taping pancake-head screw of 1-1/4-inch length or suitable to obtain a minimum of 3/8-inch penetration beyond inside surface of metal; spacing as recommended by simulated stone manufacturer.
  - 4. Cleaner: Nonacid cleaner as recommended by simulated stone manufacturer.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examination: Examine conditions and proceed with work in accordance with Section 01 40 00 - Quality Requirements. Verify that:
  - 1. Field conditions are acceptable and are ready to receive work.
  - 2. Items provided by other sections of work are properly sized and located.
  - 3. Built-in items, including electrical devices and plumbing items, are in proper location and ready for roughing into masonry work.
  - 4. Correct product prior to installation.

- B. Consult with Owner and manufacturer if deficiencies exist. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of stone cladding. Correct deficiencies in accordance with stone manufacturer's recommendations.
- C. Initiating installation constitutes Installer's acceptance of existing surfaces and substrate.

### **3.02 PREPARATION**

- A. Protection of In-Place Conditions: Protect surrounding area from possible damage during installation work.

### **3.03 INSTALLATION**

- A. Lathing: Apply metal lath taut, with long dimension perpendicular to supports.
  - 1. Lap ends minimum 4 inch. Secure end laps with tie wire where they occur between supports.
  - 2. Lap sides of lath minimum 4 inches. Lap corners at 12 inches minimum.
  - 3. Attach metal lath to framing using screws of type, size, and spacing as recommended by system manufacturer.
  - 4. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 12 inches from corner to form the angle reinforcement; fasten at perimeter edges only.
  - 5. Place 4 inch wide strips of metal lath centered over junctions of dissimilar backing materials.
  - 6. Apply metal lath to surfaces, attach with galvanized fasteners 6 inches on center vertically and 16 inches on center horizontally.
  - 7. Secure rigidly in place.
  - 8. Do not use staples.
  - 9. Wrap metal lath a minimum of 16 inches around all outside and inside corners.
- B. Mortar: Thoroughly mix mortar ingredients in quantities needed for immediate use.
  - 1. Apply 1/2 inch to 3/4 inch of mortar to lath not exceeding maximum coverage limits of the manufacturer at one time.
  - 2. If required by the manufacturer, allow mortar to dry prior to installing units.
- C. Simulated Stone Veneer: Install in accordance with manufacturer's instructions.
  - 1. Press units firmly into position, wiggle each piece slightly and apply light pressure to unit to ensure firm bonding, causing mortar to extrude slightly around edges of units and to leave a joint width of 3/8 inch. Do not allow mortar to set up prior to installing units.
    - a. Joints width shall not exceed 1/2 inch.
  - 2. Place units from bottom up starting at 4 inches above grade unless otherwise indicated with uniform mortar joints tooled per approved Mock-Up in accordance with manufacturer's instructions. Tool joints before mortar has set.
  - 3. Do not align joints vertically. Install outside and inside corner return units with short and long lengths alternated to maintain "toothed" appearance.
    - a. Minimum Width of Units at Inside Corners and at Perimeters of Openings: 6 inches.
    - b. After the first corner piece is in place, apply the adjoining flat pieces of each course or pattern b.



4. Using a trowel, strike off the excess mortar around the edges of the component prior to placing the next unit.
  - a. Do not allow mortar to set up on face of units, but at the same time, do not allow mortar to smear on the surface of the units. Remove mortar only after it has become crumbly.
5. Install wall caps as work progresses, using same techniques as units in field of wall.
- D. Plan work to minimize jobsite cutting. Perform necessary cutting with proper tools to provide uniform edges; take care to prevent breaking unit corners or edges.
- E. Remove excess mortar; do not allow mortar to dry on face of units.
  1. Point and tool joints before mortar has set.
  2. Clean and finish joints in accordance with COR's and manufacturer's instructions.
- F. Control Joints: Size in accordance with Section 07 92 00 - Joint Sealants for sealant performance.
- G. Expansion Joints: Provide where indicated on Drawings or as recommended by system manufacturer.
- H. Built-In Work: As work progresses, build in items specified in various sections.
  1. Build in items plumb and level.
  2. Do not build in organic materials subject to deterioration.

### 3.04 CLEANING

- A. Cleaning: Comply with Section 01 70 00 - Execution and Closeout Requirements.
  1. Remove excess mortar and smears using bristle brush or steel wool.
  2. Replace defective mortar. Match adjacent work.
  3. Clean soiled surfaces with non-acidic solution, acceptable to the stone manufacturer, which will not harm masonry or adjacent materials. Rinse immediately with water.
  4. Leave surfaces thoroughly clean and free of mortar and other soiling.
  5. Use nonmetallic tools in cleaning operations. Do not use a wire brush or a high-pressure power washer, both of which can cause damage to the surface.
  6. Remove temporary coverings and protection of adjacent work areas.

- - - END - - -



**SECTION 05 50 00  
METAL FABRICATIONS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies items and assemblies fabricated from structural steel shapes and other materials as shown and specified.
- B. Items specified.
  - 1. Support for Wall- and Ceiling-Mounted Items

**1.2 RELATED WORK**

- B. Prime and finish painting: Section 09 91 00, PAINTING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings:
  - 1. Each item specified, showing complete detail, location in the Project, material and size of components, method of joining various components and assemblies, finish, and location, size and type of anchors.
  - 3. Provide templates and rough-in measurements as required.

**1.4 QUALITY ASSURANCE**

- A. Each manufactured product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.
- B. Each product type shall be the same and be made by the same manufacturer.
- C. Assemble product to the greatest extent possible before delivery to the Project site.
- D. Include additional features, which are not specifically prohibited by this Specification, but which are a part of the manufacturer's standard commercial product.

**1.5 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society of Mechanical Engineers (ASME):
  - B18.6.1-97.....Wood Screws
  - B18.2.2-87(R2005).....Square and Hex Nuts
- C. American Society for Testing and Materials (ASTM):

- A36/A36M-12.....Structural Steel
- A53/A53M-12.....Pipe, Steel, Black and Hot-Dipped, Zinc-Coated  
Welded and Seamless
- A123/A123M-12.....Zinc (Hot-Dip Galvanized) Coatings on Iron and  
Steel Products
- A240/A240M-14.....Standard Specification for Chromium and  
Chromium-Nickel Stainless Steel Plate, Sheet  
and Strip for Pressure Vessels and for General  
Applications.
- A307-12.....Carbon Steel Bolts and Studs, 60,000 PSI  
Tensile Strength
- A525.....General Requirements for Steel Sheet, Zinc-  
Coated (Galvanized) by the Hot-Dip Process.
- C1107-13.....Packaged Dry, Hydraulic-Cement Grout  
(Nonshrink)
- F436-11.....Hardened Steel Washers
- F468-06(R2012).....Nonferrous Bolts, Hex Cap Screws, Socket Head  
Cap Screws and Studs for General Use
- D. American Welding Society (AWS):
- D1.1-10.....Structural Welding Code Steel
- D1.3-08.....Structural Welding Code Sheet Steel
- E. National Association of Architectural Metal Manufacturers (NAAMM)
- AMP 521-01.....Pipe Railing Manual
- AMP 500-06.....Metal Finishes Manual
- F. Structural Steel Painting Council (SSPC)/Society of Protective  
Coatings:
- SP 1-04.....No. 1, Solvent Cleaning
- SP 2-04.....No. 2, Hand Tool Cleaning
- SP 3-04.....No. 3, Power Tool Cleaning
- G. Federal Specifications (Fed. Spec):
- RR-T-650E.....Treads, Metallic and Nonmetallic, Nonskid

## **PART 2 - PRODUCTS**

### **2.1 DESIGN CRITERIA (NOT USED)**

### **2.2 MATERIALS**

- A. Structural Steel: ASTM A36.
- B. Stainless Steel: ASTM A240/A240M, Type 302 or 304.
- D. Primer Paint: As specified in Section 09 91 00, PAINTING.
- E. Modular Channel Units:

1. Factory-fabricated, channel-shaped, cold-formed sheet steel shapes, complete with fittings bolts and nuts required for assembly.
2. Form channel within turned pyramid shaped clamping ridges on each side.
3. Provide case-hardened steel nuts with serrated grooves in the top edges designed to be inserted in the channel at any point and be given a quarter turn so as to engage the channel clamping ridges. Provide each nut with a spring designed to hold the nut in place.
4. Factory-finish channels and parts with oven-baked primer when exposed to view. Channels fabricated of ASTM A525, G90 galvanized steel may have primer omitted in concealed locations. Finish screws and nuts with zinc coating.
5. Fabricate snap-in closure plates to fit and close exposed channel openings of not more than 0.3 mm (0.0125 inch) thick stainless steel.

F. Grout: ASTM C1107, pourable type.

## **2.3 HARDWARE**

### **A. Rough Hardware:**

1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; galvanized, cadmium-plated, or zinc-coated by electro-galvanizing process. Galvanized G-90 where specified.
2. Use G90 galvanized coating on ferrous metal for exterior work unless non-ferrous metal or stainless is used.

### **B. Fasteners:**

1. Bolts with Nuts:
  - a. ASME B18.2.2.
  - b. ASTM A307 for 415MPa (60,000 psi) tensile strength bolts.
  - c. ASTM F468 for nonferrous bolts.
2. Screws: ASME B18.6.1.
3. Washers: ASTM F436, type to suit material and anchorage.

## **2.4 FABRICATION GENERAL**

### **A. Material**

1. Use material as specified. Use material of commercial quality and suitable for intended purpose for material that is not named or its standard of quality not specified.
2. Use material free of defects which could affect the appearance or serviceability of the finished product.

## B. Size:

1. Size and thickness of members as shown.
2. When size and thickness is not specified or shown for an individual part, use size and thickness not less than that used for the same component on similar standard commercial items or in accordance with established shop methods.

## C. Connections

1. Except as otherwise specified, connections may be made by welding, riveting, or bolting.
2. Field-riveting will not be approved.
3. Design size, number and placement of fasteners, to develop a joint strength of not less than the design value.
4. Holes, for rivets and bolts: Accurately punched or drilled and burrs removed.
5. Size and shape welds to develop the full design strength of the parts connected by welds and to transmit imposed stresses without permanent deformation or failure when subject to service loadings.
6. Use rivets and bolts of material selected to prevent corrosion (electrolysis) at bimetallic contacts. Plated or coated material will not be approved.
7. Use stainless steel connectors for removable members machine screws or bolts.

## D. Fasteners and Anchors

1. Use methods for fastening or anchoring metal fabrications to building construction as shown or specified.
2. Where fasteners and anchors are not shown, design the type, size, location and spacing to resist the loads imposed without deformation of the members or causing failure of the anchor or fastener, and suit the sequence of installation.
3. Use material and finish of the fasteners compatible with the kinds of materials which are fastened together and their location in the finished work.
4. Fasteners for securing metal fabrications to new construction only, may be by use of threaded or wedge type inserts or by anchors for welding to the metal fabrication for installation before the concrete is placed or as masonry is laid.
5. Fasteners for securing metal fabrication to existing construction or new construction may be expansion bolts, toggle bolts, power

actuated drive pins, welding, self-drilling and -tapping screws or bolts, unless indicated otherwise.

E. Workmanship:

1. General:

- a. Fabricate items to design shown.
- b. Furnish members in longest lengths commercially available within the limits shown and specified.
- c. Fabricate straight, true, free from warp and twist, and where applicable square and in same plane.
- d. Provide holes, sinkages, and reinforcement shown and required for fasteners and anchorage items.
- e. Provide openings, cut-outs, and tapped holes for attachment and clearances required for work of other trades.
- f. Prepare members for the installation and fitting of hardware.
- g. Fabricate surfaces and edges free from sharp edges, burrs and projections which may cause injury.

2. Welding:

- a. Weld in accordance with AWS.
- b. Welds shall show good fusion, be free from cracks and porosity and accomplish secure and rigid joints in proper alignment.
- c. Where exposed in the finished work, continuous weld for the full length of the members joined and have depressed areas filled and protruding welds finished smooth and flush with adjacent surfaces.
- d. Finish welded joints to match finish of adjacent surface.

3. Joining:

- a. Miter or butt members at corners.
- b. Where frames members are butted at corners, cut leg of frame member perpendicular to surface, as required for clearance.

4. Anchors:

- a. Where metal fabrications are shown to be preset in concrete, weld 32 x 3 mm (1-1/4 by 1/8 inch) steel strap anchors, 150 mm (6 inches) long with 25 mm (one inch) hooked end, to back of member at 600 mm (2 feet) on center, unless otherwise shown.
- b. Where metal fabrications are shown to be built into masonry use 32 x 3 mm (1-1/4 by 1/8 inch) steel strap anchors, 250 mm (10 inches) long with 50 mm (2 inch) hooked end, welded to back of member at 600 mm (2 feet) on center, unless otherwise shown.

## 5. Cutting and Fitting:

- a. Accurately cut, machine and fit joints, corners, copes, and miters.
- b. Fit removable members to be easily removed.
- c. Design and construct field connections in the most practical place for appearance and ease of installation.
- d. Fit pieces together as required.
- e. Fabricate connections for ease of assembly and disassembly without use of special tools.
- f. Joints shall be firm when assembled.
- g. Conceal joining, fitting, and welding on exposed work as far as practical.
- h. Do not show rivets and screws prominently on the exposed face.
- i. The fit of components and the alignment of holes shall eliminate the need to modify component or to use exceptional force in the assembly of item and eliminate the need to use other than common tools.

## F. Finish:

- 1. Finish exposed surfaces in accordance with NAAMM AMP 500 Metal Finishes Manual.
- 2. Steel and Iron: NAAMM AMP 504.
  - a. Zinc coated (Galvanized): ASTM A123/A123M, G90 unless noted otherwise. Provide the following instructions to the galvanizer:
    - 1) Do not "quench" the galvanized finish.
    - 2) Do not apply a post-galvanizing treatment that might interfere with paint adhesion.
  - b. Surfaces exposed in the finished work:
    - 1) Finish smooth rough surfaces and remove projections.
    - 2) Fill holes, dents and similar voids and depressions with epoxy-type patching compound.
  - c. Shop Prime Painting:
    - 1) Surfaces of Ferrous metal:
      - a) Items not specified to have other coatings.
      - b) Galvanized surfaces specified to have prime paint.
      - c) Remove all loose mill scale, rust, and paint, by hand or power tool cleaning as defined in SSPC-SP2 and SP3.



d) Clean of oil, grease, soil and other detrimental matter by use of solvents or cleaning compounds as defined in SSPC-SP1.

e) After cleaning and finishing apply one coat of primer as specified in Section 09 91 00, PAINTING.

2) Non ferrous metals: Comply with MAAMM-500 series.

G. Protection:

1. Spot-prime all abraded and damaged areas of zinc coating which expose the bare metal, using zinc-rich paint on hot-dip zinc coat items and zinc-dust primer on all other zinc-coated items.

## 2.5 SUPPORTS

A. General:

1. Fabricate ASTM A36/A36M structural steel shapes as shown.
2. Use clip angles or make provisions for welding hangers and braces to overhead construction.
3. Field connections may be welded or bolted.

B. For Wall-Mounted Items:

1. For items supported by metal-stud partitions.
2. Steel strip or hat channel minimum of 1.5 mm (0.0598 inch) thick.
3. Steel strip minimum of 150 mm (6 inches) wide, length extending one stud space beyond end of item supported.
4. Steel hat channels where shown. Flange cut and flattened for anchorage to stud.
5. Use steel angles for thru-wall counters. Drill angle for fasteners at ends and not over 100 mm (4 inches) on center between ends.

C. For Trapeze Bars:

1. Construct assembly above ceilings as shown and design to support not less than a 340 kg (750 pound) working load at any point.
2. Fabricate trapeze supports as shown, with all exposed members, including screws, nuts, bolts and washers, fabricated of stainless steel.
3. Fabricate concealed components of structural steel shapes unless shown otherwise.
4. Continuously weld connections where welds shown.
5. Use modular channel where shown with manufacturers bolts and fittings.
  - a. Weld ends of steel angle braces to steel plates and secure to modular channel units as shown. Drill plates for anchor bolts.

- b. Fabricate eye bolt, special clamp bolt, and plate closure full length of modular channel at ceiling line and secure to modular channel unit with manufacturers standard fittings.
- D. For Cubical Curtain Track:
  - 1. Fabricate assembly of steel angle as shown.
  - 2. Drill angle bent ends for anchor screws to acoustical suspension system and angle for hanger wires.
  - 3. Provide pipe sleeve welded to angle.

**2.6 FRAMES (NOT USED)****2.7 GUARDS (NOT USED)****2.8 COVERS AND FRAMES FOR PITS AND TRENCHES (NOT USED)****2.9 GRATINGS (NOT USED)****2.10 LOOSE LINTELS (NOT USED)****2.11 SHELF ANGLES (NOT USED)****2.12 PLATE DOOR SILL (NOT USED)****2.13 SAFETY NOSINGS (NOT USED)****2.14 LADDERS (NOT USED)****2.15 RAILINGS (NOT USED)****2.16 CATWALKS (NOT USED)****2.17 TRAP DOOR AND FRAMES WITH CEILING HATCH (NOT USED)****2.18 SIDEWALK DOOR (NOT USED)****2.19 SCREENED ACCESS DOORS AND FRAMES (NOT USED)****2.20 STEEL COUNTER OR BENCH TOP FRAME AND LEGS (NOT USED)****PART 3 - EXECUTION****3.1 INSTALLATION, GENERAL**

- A. Set work accurately, in alignment and where shown, plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Items set into concrete or masonry.
  - 1. Provide temporary bracing for such items until concrete or masonry is set.
  - 2. Place in accordance with setting drawings and instructions.
  - 3. Build strap anchors, into masonry as work progresses.
- C. Field weld in accordance with AWS.
  - 1. Design and finish as specified for shop welding.
  - 2. Use continuous weld unless specified otherwise.
- D. Install anchoring devices and fasteners as shown and as necessary for securing metal fabrications to building construction as specified.

Power-actuated drive pins may be used except for removable items and where members would be deformed or substrate damaged by their use.

- E. Spot-prime all abraded and damaged areas of zinc coating as specified and all abraded and damaged areas of shop-prime coat with same kind of paint used for shop-priming.
- F. Secure escutcheon plate with set screw.

### **3.2 INSTALLATION OF SUPPORTS**

- A. Anchorage to structure.
  - 1. Secure angles or channels and clips to overhead structural steel by continuous welding unless bolting is shown.
  - 2. Secure supports to concrete inserts by bolting or continuous welding as shown.
  - 3. Secure supports to mid height of concrete beams (when inserts do not exist) with expansion bolts and to slabs, with expansion bolts, unless shown otherwise.
  - 4. Secure steel plate or hat channels to studs as detailed.
- B. Supports for Wall-Mounted items:
  - 1. Locate center of support at anchorage point of supported item.
  - 2. Locate support at top and bottom of wall-hung cabinets.
  - 3. Locate support at top of floor cabinets and shelving installed against walls.
  - 4. Locate supports where required for items shown.
- D. Supports for Trapeze Bars:
  - 1. Secure plates to overhead construction with fasteners as shown.
  - 2. Secure angle brace assembly to overhead construction with fasteners as shown and bolt plate to braces.
  - 3. Fit modular channel unit flush with finish ceiling, and secure to plate with modular channel unit manufacturer's standard fittings through steel shims or spreaders as shown.
    - a. Install closure plates in channel between eye bolts.
    - b. Install eyebolts in channel.

3.3 COVERS AND FRAMES FOR PITS AND TRENCHES (NOT USED)

3.4 FRAMES FOR LEAD LINED DOORS (NOT USED)

3.5 DOOR FRAMES (NOT USED)

3.6 OTHER FRAMES (NOT USED)

3.7 GUARDS (NOT USED)

3.8 GRATINGS (NOT USED)

3.9 STEEL LINTELS (NOT USED)

3.10 SHELF ANGLES (NOT USED)

3.11 PLATE DOOR SILL (NOT USED)

3.12 SAFETY NOSINGS (NOT USED)

3.13 LADDERS (NOT USED)

3.14 RAILINGS (NOT USED)

3.15 CATWALK AND PLATFORMS (NOT USED\_)

3.16 SIDEWALK DOOR, TRAP DOORS, AND FRAMES (NOT USED)

3.17 SCREENED ACCESS DOOR (NOT USED)

3.18 STEEL COMPONENTS FOR MILLWORK ITEMS

- A. Coordinate and deliver to Millwork fabricator for assembly where millwork items are secured to metal fabrications.

3.19 CLEAN AND ADJUSTING

- A. Adjust movable parts including hardware to operate as designed without binding or deformation of the members centered in the opening or frame and, where applicable, contact surfaces fit tight and even without forcing or warping the components.
- B. Clean after installation exposed prefinished and plated items, as recommended by the metal manufacture and protected from damage until completion of the Project.

- - - E N D - - -

**SECTION 06 10 00  
ROUGH CARPENTRY**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies wood blocking and rough hardware.

**1.2 RELATED WORK:**

- A. Milled woodwork: Section 06 20 00, FINISH CARPENTRY.

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings showing connection details, fasteners, connections, and dimensions.
- C. Manufacturer's Literature and Data:
1. Submit data for lumber, panels, hardware, and adhesives.
  2. Submit data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
  3. For products receiving a waterborne treatment, submit statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- D. Manufacturer's certificate for unmarked lumber.

**1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:**

- A. Protect lumber and other products from dampness both during and after delivery at Project site.
- B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.
- C. Stack plywood and other board products so as to prevent warping.
- D. Locate stacks on well drained areas, supported at least 152 mm (6 inches) above grade and cover with well-ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

**1.5 QUALITY ASSURANCE:**

- A. Installer: A firm with a minimum of three (3) years' experience in the type of work required by this Section.

**1.6 GRADING AND MARKINGS:**

- A. Any unmarked lumber or plywood panel for its grade and species will not be allowed on VA Construction sites for lumber and material not normally grade marked, provide manufacturer's certificates (approved by an American Lumber Standards approved agency) attesting that lumber and material meet the specified the specified requirements.

**1.7 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Wood Council's (AWC) Wood Design Standards Committee:  
 NDS-15.....National Design Specification for Wood  
 Construction  
 WCD1-01.....Details for Conventional Wood Frame  
 Construction
- C. American Society of Mechanical Engineers (ASME):  
 B18.6.1-81(R2008).....Wood Screws
- D. The Engineered Wood Association (APA):  
 E30-11.....Engineered Wood Construction Guide
- E. ASTM International (ASTM):  
 A653/A653M-13.....Steel Sheet Zinc-Coated (Galvanized) or Zinc-  
 Iron Alloy Coated (Galvannealed) by the Hot Dip  
 Process  
 C954-11.....Steel Drill Screws for the Application of  
 Gypsum Board or Metal Plaster Bases to Steel  
 Studs from 0.033 inch (2.24 mm) to 0.112-inch  
 (2.84 mm) in thickness  
 C1002-14.....Steel Self-Piercing Tapping Screws for the  
 Application of Gypsum Panel Products or Metal  
 Plaster Bases to Wood Studs or Metal Studs  
 D2559-12a.....Adhesives for Structural Laminated Wood  
 Products for Use Under Exterior (Wet Use)  
 Exposure Conditions  
 F844-07a(R2013).....Washers, Steel, Plan (Flat) Unhardened for  
 General Use  
 F1667-13.....Nails, Spikes, and Staples
- F. American Wood Protection Association (AWPA):  
 .....AWPA Book of Standards

T1.....Use Category System: Processing and Treatment  
Standard

1. Preservative retention and penetration requirements.
2. Processing limitations.
3. Quality control and inspection requirements.

U1.....Use Category System: User Specifications for  
Treated Wood

1. UC2 - Interior/Damp.
2. UCF - Fire Retardant.
  - a. UCFA - Fire Retardant, Interior.

G. Commercial Item Description (CID):

A-A-55615.....Shield, Expansion (Wood Screw and Lag Bolt Self  
Threading Anchors)

H. Military Specification (Mil. Spec.):

MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated

I. U.S. Department of Commerce Product Standard (PS)

PS 1-95.....Construction and Industrial Plywood

PS 20-10.....American Softwood Lumber Standard

## **PART 2 - PRODUCTS**

### **2.1 LUMBER:**

A. Unless otherwise specified, each piece of lumber must bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.

1. Identifying marks are to be in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.

B. Lumber Other Than Structural:

1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
2. Blocking and similar items 101 mm (4 inches) and narrower Standard Grade; and, members 152 mm (6 inches) and wider, Number 2 Grade.

## C. Sizes:

1. Conforming to PS 20.
2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.

## D. Moisture Content:

1. Maximum moisture content of wood products is to be as follows at the time of delivery to Project site.
  - a. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
  - b. Lumber over 50 mm (2 inches) thick: 25 percent or less.

## E. Fire Retardant Treatment:

1. Comply with Mil Spec. MIL-L-19140, Category UCFA per AWPA U1, and AWPA T1.
2. Treatment and performance inspection per AWPA T1, by an independent and qualified testing agency that establishes performance ratings.

**2.2 PLASTIC LUMBER (NOT USED)****2.3 PLYWOOD:**

- A. Comply with PS 1.
- B. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.

**2.4 STRUCTURAL-USE PANELS (NOT USED)****2.5 ROUGH HARDWARE AND ADHESIVES:**

- A. Miscellaneous Bolts: Expansion Bolts: C1D A-A-55615; lag bolt, long enough to extend at least 65 mm (2-1/2 inches) into masonry or concrete. Provide 13 mm (1/2 inch) bolt unless shown otherwise.
- B. Washers
  1. ASTM F844.
  2. Provide zinc or cadmium coated steel or cast iron for washers exposed to weather.
- C. Screws:
  1. Wood to Wood: ASME B18.6.1 or ASTM C1002.
  2. Wood to Steel: ASTM C954, or ASTM C1002.
- D. Nails:



1. Size and type best suited for purpose unless noted otherwise.  
Provide aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing wood work exposed to weather and on roof blocking.
2. ASTM F1667:
  - a. Common: Type I, Style 10.
  - b. Concrete: Type I, Style 11.
  - c. Barbed: Type I, Style 26.
  - d. Underlayment: Type I, Style 25.
  - e. Masonry: Type I, Style 27.
  - f. Provide special nails designed for use with ties, strap anchors, connectors, and similar items. Nails not less than 32 mm (1-1/4 inches) long, 8d and deformed or annular ring shank.

E. Connectors:

1. Fabricate of ASTM A653/A653M, Grade A; steel sheet not less than 1.3 mm (0.052 inch) thick unless specified otherwise. Apply standard plating to steel connectors after punching, forming and assembly of parts.
2. Angles: Angle designed with bendable legs to provide three (3) way anchors.
3. Straps:
  - a. Designed to provide wind and seismic ties with sizes as shown or specified.
  - b. Strap ties not less than 32 mm (1-1/4 inches) wide.
  - c. Punched for fastener.
4. Joint Plates:
  - a. Steel plate punched for nails.
  - b. Steel plates formed with teeth or prongs for mechanically clamping plates to wood.
  - c. Size for axial eccentricity, and fastener loads.

F. Adhesives:

1. For Laminated Wood: ASTM D2559.

**PART 3 - EXECUTION**

**3.1 INSTALLATION OF MISCELLANEOUS WOOD MEMBERS:**

- A. Conform to applicable requirements of the following:
1. NDS developed by the American Wood Council's (AWC) Wood Design Standards Committee for connectors.
  2. AFPA WCD1 for nailing unless specified otherwise.
  3. APA E30 for installation of plywood.

## B. Fasteners:

## 1. Nails.

- a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA WCD1 where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.
- b. Use special nails with connectors.
- c. Use 8d or larger nails for nailing through 25 mm (1 inch) thick lumber and for toe nailing 50 mm (2 inch) thick lumber.
- d. Use 16d or larger nails for nailing through 50 mm (2 inch) thick lumber.
- e. Select the size and number of nails in accordance with the Nailing Schedule except for special nails with anchors.

## 2. Bolts:

- a. Fit bolt heads and nuts bearing on wood with washers.
- b. Countersink bolt heads flush with the surface of nailers.
- c. Provide expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.
- d. Provide toggle bolts to hollow masonry or sheet metal.
- e. Provide bolts to steel over 2.84 mm (0.112 inch, 11 gage) in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 610 mm (24 inch) intervals between end bolts. Provide clips to beam flanges.

## 3. Drill Screws to steel less than 2.84 mm (0.112 inch) thick.

- a. ASTM C1002 for steel less than 0.84 mm (0.033 inch) thick.
- b. ASTM C954 for steel over 0.84 mm (0.033 inch) thick.

## 4. Power-actuated drive pins may be provided where practical to anchor to solid masonry, concrete, or steel.

## 5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Provide metal plugs, inserts or similar fastening.

## 6. Screws to Join Wood:

- a. Where shown or option to nails.
- b. ASTM C1002, sized to provide not less than 25 mm (1 inch) penetration into anchorage member.
- c. Spaced same as nails.

## 7. Installation of Timber Connectors:

- a. Conform to applicable requirements of the NDS developed by the American Wood Council's (AWC) Wood Design Standards Committee.
  - b. Fit wood to connectors and drill holes for fasteners so wood is not split.
- C. Cut notch, or bore in accordance with AFPA WCD1 passage of ducts wires, bolts, pipes, conduits and to accommodate other work. Repair or replace miscut, misfit or damaged work.
- D. Blocking:
  - 1. Install blocking where shown.
  - 2. Provide longest lengths practicable.
  - 3. Provide fire-retardant-treated wood blocking where shown at openings and where shown or specified.
  - 4. Layers of Blocking or Plates:
    - a. Stagger end joints between upper and lower pieces.
    - b. Nail at ends and not over 610 mm (24 inches) between ends.
    - c. Stagger nails from side to side of wood member over 127 mm (5 inches) in width.
- E. Rough Bucks:
  - 1. Install rough wood bucks at opening in masonry or concrete where wood trim occurs.
  - 2. Brace and maintain bucks plumb and true until masonry has been built around them or concrete cast in place.
  - 3. Cut rough bucks from 50 mm (2 inch) thick stock, of same width as partitions in which they occur and of width shown in exterior walls.
  - 4. Extend bucks full height of openings and across head of openings; fasten securely with anchors specified.

- - - E N D - - -



**SECTION 06 20 00  
FINISH CARPENTRY**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies exterior and interior millwork.
- B. Items specified.
  - Custom cabinetry

**1.2 RELATED WORK**

- A. Fabricated metal brackets, bench supports and countertop legs: Section 05 50 00, METAL FABRICATIONS.
- B. Blocking: Section 06 10 00, ROUGH CARPENTRY.
- C. Wood doors: Section 08 14 00, INTERIOR WOOD DOORS.
- D. Color and texture of finish: Section 09 06 00, SCHEDULE FOR FINISHES.
- E. Stock Casework: Section 12 32 00, MANUFACTURED WOOD CASEWORK.
- F. Countertops: Division 12, FURNISHINGS.
- G. Electrical light fixtures and duplex outlets: Division 26, ELECTRICAL.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings:
  - 1. Millwork items - Half full size scale for sections and details 1:50 (1/4-inch) for elevations and plans.
  - 2. Show construction and installation.
- C. Samples:
  - Plastic laminate finished plywood or particleboard, 150 mm by 300 mm (six by twelve inches).
- D. Certificates:
  - 1. Indicating fire retardant treatment of materials meet the requirements specified.
  - 2. Indicating moisture content of materials meet the requirements specified.
- E. List of acceptable sealers for fire retardant and preservative treated materials.
- F. Manufacturer's literature and data:
  - 1. Finish hardware
  - 2. Electrical components

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Protect lumber and millwork from dampness, maintaining moisture content specified both during and after delivery to Project site.

- B. Store lumber and millwork in weathertight well ventilated structures or in space in existing buildings designated by COR. Store at a minimum temperature of 21°C (70°F) for not less than 10 days before installation.
- C. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

### 1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society of Testing and Materials (ASTM):
  - A36/A36M-08.....Structural Steel
  - A53/A53M-12.....Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless
  - A167-99 (R2009).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
  - B26/B26M-09.....Aluminum-Alloy Sand Castings
  - B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
  - E84-10.....Surface Burning Characteristics of Building Materials
- C. American Hardboard Association (AHA):
  - A135.4-04.....Basic Hardboard
- D. Builders Hardware Manufacturers Association (BHMA):
  - A156.9-03.....Cabinet Hardware
  - A156.11-10.....Cabinet Locks
  - A156.16-08.....Auxiliary Hardware
- E. National Particleboard Association (NPA):
  - A208.1-09.....Wood Particleboard
- F. Architectural Woodwork Institute (AWI) / Architectural Woodwork Manufacturers Association of Canada (AWMAC) / Woodwork Institute (WI):
  - AWS-09.....Architectural Woodwork Standards
- G. Architectural Woodwork Institute (AWI):
  - AWI Quality Certification Program
- H. National Electrical Manufacturers Association (NEMA):
  - LD 3-05.....High-Pressure Decorative Laminates
- I. U.S. Department of Commerce, Product Standard (PS):
  - PS1-07.....Structural Plywood
  - PS20-10.....American Softwood Lumber Standard
- J. Military Specification (Mil. Spec):
  - MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated

## K. Federal Specifications (Fed. Spec.):

A-A-1922A.....Shield Expansion (Caulking Anchors, Single Lead)

A-A-1936A.....Adhesives, Contact Neoprene Rubber

FF-N-836D.....Nut: Square, Hexagon Cap, Slotted, Castle,  
Knurled, Welding and Single Ball Seat

FF-S-111D(1).....Screw, Wood

**PART 2 - PRODUCTS****2.1 BIO-BASED MATERIAL:**

Bio-based Materials: For products designated by the USDA's Bio-Preferred program, provide products that meet or exceed USDA recommendations for bio-based content, so long as products meet all performance requirements in this specification section. For more information regarding the product categories covered by the Bio-Preferred program, visit

<http://www.bio-preferred.gov>

**2.2 LUMBER**

## A. Grading and Marking:

1. Lumber shall bear the grade mark, stamp, or other identifying marks indicating grades of material.
2. Such identifying marks on a material shall be in accordance with the rule or standard under which the material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
3. The inspection agency for lumber shall be approved by the Board of Review, American Lumber Standards Committee, to grade species used.

## B. Sizes:

1. Lumber Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which product is produced.
2. Millwork: Actual size as shown or specified.

**2.3 PLYWOOD**

## A. Softwood Plywood:

1. Prod. Std.
2. Grading and Marking:
  - a. Each sheet of plywood shall bear the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood.
  - b. The mark shall identify the plywood by species group or identification index, and shall show glue type, grade, and compliance with PS1.

3. Plywood, 13 mm (1/2 inch) and thicker; not less than five ply construction, except 32 mm (1-1/4 inch) thick plywood not less than seven ply.
4. Plastic Laminate Plywood Cores:
  - a. Exterior Type, any species group.
  - b. Veneer Grade: A-C.
5. Other: As specified for item.

#### **2.4 PARTICLEBOARD**

- A. NPA A208.1
- B. Plastic Laminate Particleboard Cores:
  1. Use Type 1, Grade 1-M-3, or Type 2, Grade 2-M-2, unless otherwise specified.
  2. Use Type 2, Grade 2-M-2, exterior bond, for tops with sinks.
- C. General Use: Type 1, Grade 1-M-3 or Type 2, Grade 2-M-2.

#### **2.5 PLASTIC LAMINATE**

- A. NEMA LD-3.
- B. Exposed decorative surfaces including both sides of cabinet doors, and for items having plastic laminate finish. General Purpose, Type HGL.
- C. Cabinet Interiors including Shelving: Both of following options to comply with NEMA, CLS as a minimum.
  1. Plastic laminate clad plywood or particle board.
  2. Resin-impregnated decorative paper thermally fused to particle board.
- D. Backing sheet on bottom of plastic laminate covered wood tops: Backer, Type HGP.
- E. Post-Forming Fabrication, Decorative Surfaces: Post-forming, Type HGP.

#### **2.6 BUILDING BOARD (HARDBOARD)**

- A. ANSI/AHA A135.4, 6 mm (1/4 inch) thick unless specified otherwise.

#### **2.7 ADHESIVE**

- A. For Plastic Laminate: Fed. Spec. A-A-1936.
- B. For Interior Millwork: Unextended urea resin, unextended melamine resin, phenol resin, or resorcinol resin.

#### **2.8 STAINLESS STEEL**

- ASTM A167, Type 302 or 304.

#### **2.9 ALUMINUM CAST**

- ASTM B26/B26M.

#### **2.10 ALUMINUM EXTRUDED**

- ASTM B221.

#### **2.11 HARDWARE**

- A. Rough Hardware:



1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; galvanized, cadmium plated, or zinc-coated by electric-galvanizing process. Galvanized where specified.
2. Fasteners:
  - a. Bolts with Nuts: FF-N-836.
  - b. Expansion Bolts: A-A-1922A.
  - c. Screws: Fed. Spec. FF-S-111.

#### B. Finish Hardware

1. Cabinet Hardware: ANSI A156.9.
  - a. Door/Drawer Pulls: B02011. Door in seismic zones: B03182.
  - b. Drawer Slides: B05051 for drawers over 150 mm (6 inches) deep, B05052 for drawers 75 mm to 150 mm (3 to 6 inches) deep, and B05053 for drawers less than 75 mm (3 inches) deep.
  - c. Sliding Door Tracks: B07063.
  - d. Adjustable Shelf Standards: B4061 with shelf rest B04083.
  - e. Concealed Hinges: B1601, minimum 110 degree opening.
    1. Provide concealed hinges with "soft-close" feature where indicated.
  - f. Cabinet Door Catch: B0371 or B03172.
2. Cabinet Locks: ANSI A156.11.
  - a. Drawers and Hinged Door: E07262.
5. Primers: Manufacturer's standard primer for steel providing baked enamel finish.

### 2.12 MOISTURE CONTENT

- A. Moisture content of lumber and millwork at time of delivery to site.
  1. Interior finish lumber, trim, and millwork 32 mm (1-1/4 inches) or less in nominal thickness: 12 percent on 85 percent of the pieces and 15 percent on the remainder.
  2. Moisture content of other materials shall be in accordance with the standards under which the products are produced.

### 2.13 FIRE RETARDANT TREATMENT

- A. Where wood members and plywood are specified to be fire retardant treated, the treatment shall be in accordance with Mil. Spec. MIL-L19140.
- B. Treatment and performance inspection shall be by an independent and qualified testing agency that establishes performance ratings.
- C. Each piece of treated material shall bear identification of the testing agency and shall indicate performance in accordance with such rating of flame spread and smoke developed.
- D. Treat wood for maximum flame spread of 25.

E. Fire-Resistant Softwood Plywood:

1. Use Grade A, Exterior, plywood for treatment.
2. Meet the following requirements when tested in accordance with ASTM E84.
  - a. Flame spread: 0 to 25.

**2.14 PRESERVATIVE TREATMENT (NOT USED)**

**2.15 ACOUSTICAL PANEL (NOT USED)**

**2.16 FABRICATION**

A. General:

1. Except as otherwise specified, use AWS Custom Grade for architectural woodwork and interior millwork.
2. Plywood shall be not less than 13 mm (1/2 inch), unless otherwise shown or specified.
3. Plastic Laminate Work:
  - a. Factory-glued to either a plywood or a particle board core, thickness as shown or specified.
  - b. Cover exposed edges with plastic laminate, except where aluminum, stainless steel, or plastic molded edge strips are shown or specified.
  - c. Use backing sheet on concealed large panel surface when decorative face does not occur.
  - d. Access Panel: For each workstation that encloses power and data cables, provide a 20- by 20-inch access panel in a discreet but practical location, matching the finish of - and flush with - the surrounding surface and secured in place in an approved manner.

**PART 3 - EXECUTION**

**3.0 EXAMINATION**

- A. In areas requiring new work and patching, verify existing finishes shown in the finish schedule and on the plans. Immediately call any discrepancies to the COR's attention. New finishes shall match the existing finishes, unless otherwise noted.
1. Freestanding columns in a room shall receive the same finish as the room wall, unless otherwise noted.
  2. Where new finishes are applied to existing, the existing finishes shall be removed and/or the existing surfaces prepared as required to receive new finishes, unless otherwise noted. Where required to accommodate the new finishes, the mechanical, plumbing, and electrical trades shall disconnect and remove their respective devices and items and relocate to their final position in the new construction. Such devices shall include but not be limited to

electrical switches, panels, outlets, thermostats, grills, plumbing fixtures, medical gas outlets, and the like. The respective trade shall also be responsible for any permanent connections of those items which are relocated.

3. Where wall surfaces are patched to match the existing, the new finish shall be applied to the nearest corner or break in the wall plane, unless otherwise noted.
4. Millwork that is to receive new finishes, existing fixtures, devices, hardware, and accessories shall be temporarily removed as required to allow the new finish to extend under or behind the fixture or accessory and then reset.

### **3.1 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain work areas and storage areas to a minimum temperature of 21°C (70°F) for not less than 10 days before and during installation of interior millwork.
- B. Do not install finish lumber or millwork in any room or space where wet process systems such as concrete or masonry work are not complete and dry.

### **3.2 INSTALLATION**

- A. General:
  1. Use washers under bolt heads where no other bearing plate occurs.
  2. Seal cut edges of fire-retardant-treated wood materials with a certified acceptable sealer.
  3. Coordinate with plumbing and electrical work for installation of fixtures and service connections in millwork items.
  4. Plumb and level items unless shown otherwise.
  5. Nail finish at each blocking, lookout, or other nailer and intermediate points; toggle or expansion bolt in place where nails are not suitable.

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**SECTION 06 26 14**  
**PROFILE PANELING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes installing modular wall panels to create a monolithic sculptural wall.
- B. Related Requirements:
  - 1. Section 09 22 16 - Non-Structural Metal Framing.
  - 2. Section 09 91 00 - Painting: Coordination of factory primer with field-sealing of seams and field-painting of sculptural wall.

**1.02 REFERENCES**

- A. Reference Standards: The publications listed below form a part of this Section to the extent referenced. The publications are referred to within the text by the basic designation only.
  - 1. ASTM International: Standard Test Method for Surface Burning Characteristics of Building Materials (ASTM E84).

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meetings:
  - 1. Convene meeting at project site within one week of scheduled start of installation with representatives of the following in attendance:
    - a. Owner.
    - b. Owner's Commissioning Agent/Authority.
    - c. A/E.
    - d. Construction Manager.
    - e. General Trades Contractor.
    - f. Installer.
    - g. Finisher.
    - h. Painter.
  - 2. Review substrate conditions, requirements of related work, installation instructions, seam finishing, and painting instructions, storage and handling procedures, and protection measures.
  - 3. Keep minutes of meeting including responsibilities of various parties and deviations from specifications and installation instructions.
- B. Sequencing:
  - 1. Installation areas shall be enclosed and weatherproofed before installation begins.
  - 2. Permanent project lighting, including any special lighting used to highlight the sculptural wall, shall be in place and operational prior to the start of seam finishing.

**1.04 SUBMITTALS**

- A. General: Prepare, review, approve, and submit the following per Division 01 Section "Submittal Procedures."
- B. Action Submittals:
  - 1. Shop Drawings: Show the following.
    - a. Locations, including field-verified dimensions.
      - 1) Seam locations

- 2) Placement of "in-wall blocking" and or plywood skinned walls.
  - b. Pattern orientation.
  - c. Installation method.
  - d. Standard and project-specific details, including corner conditions and termination.
- C. Informational / Quality Assurance/Control Submittals:
- 1. Samples for Verification: 9 by 10 inch minimum by full thickness section of specified design for verification of texture, pattern, and thickness.
  - 2. Product Data: For each product specified. Include detailed specifications for each system component and installation accessory required.
  - 3. Test and Evaluation Reports: From a qualified independent testing laboratory documenting compliance of each component with requirements indicated.
  - 4. Manufacturer Instructions: Installation instructions from manufacturer of modular wall panels.
  - 5. Qualification Statements:
    - a. Installer: Documentation of experience in the installation of wall panels similar in complexity to those required for this Project.
- D. Closeout Submittals (Maintenance Data): For wall system components for inclusion in the operating and maintenance manual.

#### **1.05 QUALITY ASSURANCE**

- A. Regulatory Requirements (Fire-Test-Response Characteristics): Provide wall panels fabricated from fireresistance-rated materials as required to satisfy IBC Class A / NFPA Class 1 characteristics listed below (when tested in accordance with ASTM E84).
- 1. Flame-Spread Index: 25 or less.
  - 2. Smoke-Developed Index: 150 or less.
- B. Qualifications:
- 1. Installer: A minimum of three years of experience in the installation of wall panels similar in complexity to those required for this Project.
- C. Field Samples: Provide in a location selected by A/E showing representative sample of installed product, including finished seam.
- 1. Minimum Size: 8-foot square.
  - 2. Approved field sample, if undisturbed at the end of the construction period, may remain as part of the completed Work.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Storage and Handling Requirements: Follow instructions from manufacturer of modular wall panels.
- 1. Store modular wall panels in clean, dry, fully enclosed space, protected against damage from exposure to the elements, moisture, direct sunlight, and surface contamination. Maintain a room temperature of between 40 and 100 degrees Fahrenheit.
  - 2. Store modular wall panels in original, undamaged shipping crates, until ready to be installed. Loosen crate lids to allow for venting. Materials shall be stored flat. Do not stack or lean against walls.

3. Move modular wall panels to the installation areas a minimum of 48 hours prior to installation.

#### **1.07 FIELD CONDITIONS**

- A. Ambient Conditions: In the installation areas, maintain air temperature at occupancy levels (between 65 and 75 degrees Fahrenheit) and maintain relative humidity between 30 and 50 percent - from 24 hours prior to delivery of modular wall panels to the installation area - through remainder of construction period.

### **PART 2 - PRODUCTS**

#### **2.01 MODULAR WALL PANELS**

- A. Manufacturer Basis-of-Design): Interlam Corporation, Mt. Airy, North Carolina (URL: [www.interlam-design.com](http://www.interlam-design.com) <<http://www.interlam-design.com>>, Voice: 276-251-5300).
- B. Materials: Fibre-core panel made from fire-retardant-treated flakeboard, factory-sanded and factory-primed.
- C. Sculptural Design: Refer to Finish Legend on the Drawings.
- D. Fabrication Tolerances:
  1. Dimensions (Length and Width): Plus-or-minus 1/16 inch.
  2. Thickness: Plus-or-minus 1/16 inch.
- E. Installation Accessories (list will vary based on which modular wall panels are proposed):
  1. Machined birch plywood channel units, one per two columns of modular wall panels.
  2. Automotive body filler.
  3. Dry mix joint compound.
  4. Acrylic fortifier.
  5. Construction adhesive.
  6. Primer sealer.
  7. Flexible spreader.
  8. Sandpaper:
    - a. No-Load 150G.
    - b. No-Load 220G.
  9. Plastic Container: 100-ounce capacity.
  10. Measuring Cup: 8-ounce capacity.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Verification of Conditions:
  1. Examine substrates, adjacent surfaces, and conditions under which the Work will be executed, with Installer present, for compliance with requirements and other conditions affecting timely completion and performance of the Work.
  2. Coordinate with responsible entity to correct unsatisfactory conditions.
  3. Proceed with installation only after unsatisfactory conditions have been corrected.
  4. Commencement of work by installer will constitute acceptance of substrate conditions.

**3.02 PREPARATON**

- A. Surface Preparation: Prior to installation, clean substrate to remove dirt, debris, and loose particles.
- B. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

**3.03 INSTALLATION**

- A. General: Comply with written installation instructions from manufacturer of modular wall panels applicable to products and applications indicated.
  - 1. Exceptions (where requirements that are more stringent occur):
    - b. Sealing and painting of fibre-core modular wall panels shall be performed per Section 09 91 00 ("Painting").
  - 2. Seams between fibre-core modular wall panels:
    - a. Fill with a flexible seam filler that is compatible with the top coat.
    - b. Allow seam to dry.
    - c. Flush-sand prior to field-applying top coat.

**3.04 CLEANING**

- A. Immediately upon completion of installation, clean wall panels and accessories in accordance with manufacturer's recommended cleaning method.
  - 1. Apply cleaning solution or water to a clean cloth and wipe resin clean.
  - 2. Do not use a squeegee.
  - 3. Do not use strong solvents, highly alkaline or abrasive cleaning agents.
  - 4. Do not clean in hot sun or at elevated temperatures.
  - 5. Do not rub with a dry cloth.
  - 6. Do not completely saturate panels with cleaning solution or water.
- B. Remove surplus materials, rubbish, and debris resulting from installation:
  - 1. As work progresses.
  - 2. Upon completion of the Work.

**3.05 PROTECTION**

- A. Protect finished work from damage during remainder of construction period. Use materials that may be easily removed without leaving residue or permanent stains.

- - - END - - -



**SECTION 06 61 16**  
**SOLID SURFACING FABRICATIONS**

**PART 1 - GENERAL**

**1.01 DESCRIPTION OF WORK**

- A. Section includes -- but is not limited to -- the following:
  - 1. Solid-surfacing wall panels and associated trim.
- B. Related work specified elsewhere may be, but are not limited to, those listed below:
  - 1. Section 06 10 00 - Rough Carpentry: Blocking.
  - 2. Section 06 20 00 - Finish Carpentry: Coordination with architectural woodwork.
  - 3. Division 09 - Finishes: Other types of wall cladding.
  - 4. Section 12 36 00 - Countertops: Countertop construction and materials and items installed in countertops.
  - 5. Section 22 40 00 - Plumbing Fixtures.

**1.02 DEFINITION**

- A. Solid surfacing is defined as non-porous, homogeneous material maintaining the same composition throughout the piece, with a composition of polymer, aluminum-trihydrate filler, pigment (colorant), and catalyst to improve surface hardness and stain-resistance.

**1.03 SUBMITTALS**

- A. Shop Drawings:
  - 1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
    - a. Show full size details, edge details, attachments, and the like.
    - b. Show locations and sizes of furring, blocking, including concealed blocking/strapping and reinforcement specified in other Sections.
    - c. Show locations and sizes of cutouts and holes for items installed in solid surfacing.
      - 1) Plumbing fixtures.
      - 2) Other items installed in solid surfacing.
    - d. Show locations of dye-lot matched repair material left at each countertop.
- B. Product Data: For each type of product and process specified in this Section and incorporated into items of solid-surfacing work during fabrication, finishing, and installation.
  - 1. Include the following:
    - a. Hardware, brackets and accessories.
    - b. Finishing materials and processes.
- C. Certificates: For each type of product, signed by product manufacturer, certifying that they comply with requirements.
- D. Project Closeout Submittals (Maintenance Data): Submit manufacturer's care and maintenance data, including repair and cleaning instructions -- and maintenance kit for finishes.

**1.04 QUALITY ASSURANCE**

- A. Fabricator/Installer Qualifications:

1. Work of this Section shall be a shop that employs skilled workers who custom-fabricate products that are similar to those required for this Project and that have a record of successful in-service performance.
- B. Applicable Standards: Standards of the following, as referenced herein:
  1. American National Standards Institute (ANSI).
  2. ASTM International.
  3. National Electrical Manufacturers Association (NEMA).
- C. Fire-Test-Response Characteristics: Provide with the following surface-burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or another testing and inspecting agency acceptable to authorities having jurisdiction:
  1. Flame-Spread Index: 25 or less.
  2. Smoke-Developed Index: 450 or less.
  3. Interior Finish Class:
    - a. IBC: Class A
    - b. NFPA 101: Class I.

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

- A. Deliver no components to Project site until areas are ready for installation.
- B. Store components indoors prior to installation.
- C. Handle materials to prevent damage to finished surfaces.
  1. Provide protective coverings to prevent physical damage or staining following installation for duration of the Project.

#### **1.06 WARRANTY**

- A. Manufacturer's Warranty: Provide against defects in materials.
  1. Warranty shall provide material and labor to repair or replace defective materials.
  2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.
  3. Warranty Period: Ten years from date of Substantial Completion.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. See Drawings and specifications below for Manufacturers and selected products, colors, and patterns.

#### **2.02 MATERIALS**

- A. Solid Polymer Components: Cast, non-porous, filled polymer, not coated, laminated or of composite construction with through-body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified
  1. Superficial damage to a depth of 0.010 inch shall be repairable by sanding and/or polishing.
- B. Thickness: 1/4 inch.
- C. Edge Treatment: As indicated.

#### **2.03 ACCESSORIES**

- A. Joint Adhesive: Manufacturer's standard one or two-part adhesive kit to create inconspicuous, non-porous joints by chemical bond.

- B. Panel Adhesive: Manufacturer's standard neoprene-based (organic) panel adhesive complying with ANSI A108/A118/A136; UL-listed.
- C. Mastic: Product as recommended by manufacturer.
- D. Sealant: Manufacturer's standard mildew-resistant UL-listed silicone sealant in colors matching components.
- E. Conductive Tape: Manufacturer's standard aluminum foil tape, with required thickness, for use with cutouts near heat sources.
- F. Insulating Felt Tape: Manufacturer's standard for use with conductive tape in insulating solid-surfacing material from adjacent heat source.

#### **2.04 FACTORY-FABRICATION**

- A. Shop-Assembly:
  - 1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and manufacturer's printed instructions and technical bulletins.
  - 2. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
    - a. Reinforce with strip of solid-polymer material, 2-inches wide.
  - 3. Provide factory-cutouts for plumbing fittings and bath accessories as indicated on the Drawings.
  - 4. Rout and finish component edges with clean, sharp returns.
    - a. Rout cutouts, radii, and contours to template.
    - b. Smooth edges.
    - c. Repair or reject defective and inaccurate work.
- B. Vertical Surfaces with Hard Seams: 1/4-inch-thick with butt joints between sheets made with manufacturer's joint adhesive matching color of solid polymer material; adhesively applied to solid substrates; 1/8-inch-wide expansion joints filled with color-matching silicone at between 10 and 15 feet on center.

#### **2.05 FINISHES**

- A. Color(s): See Finish Legend.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

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

#### **3.02 INSTALLATION**

- A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved Shop Drawings and Product Data.
- B. Provide product in the largest pieces available.
- C. Cut and finish component edges with clean, sharp returns.
- D. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
  - 1. Exposed joints/seams shall not be allowed.

**3.03 REPAIR**

- A. Damaged work, which cannot be repaired to Architect's satisfaction, shall be replaced.

**3.04 CLEANING AND PROTECTION**

- A. Clean components during installation.
- B. Remove adhesives, sealants and other stains.

- - - END - - -

**SECTION 06 82 13**  
**SHEET RESIN FABRICATIONS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section includes sheet resin fabrications.
- B. Related work specified elsewhere may be, but are not limited to, those listed below:
  - 1. Section 06 20 00 - Finish Carpentry.
  - 2. Division 26 - Electrical (and Luminaire Schedule on the Drawings): Custom and semi-custom lighting fixtures with sheet-resin components.

**1.02 SUBMITTALS**

- A. Product Data: Indicate product description, fabrication information, and compliance with specified performance requirements.
- B. Shop Drawings: Show attachments to other work using 1/4-inch plans, elevations, sections, details.
- C. Samples for Verification: Submit minimum 36 inch by 48-inch sample for each type, texture, pattern, and color of solid polymer.
- D. Maintenance Data: Submit manufacturer's care and maintenance data, including care, repair, and cleaning instructions. Include in Project closeout documents.

**1.03 QUALITY ASSURANCE**

- A. Fire-Test-Response Characteristics: Ensure compliance with the following requirements.
  - 1. Rate of Burning (for a nominal thickness of 0.060 inch per ASTM D635): Class CC1.
  - 2. Self-Ignition Temperature (ASTM D1929): Pass (greater than 650 degrees Fahrenheit).
  - 3. Density of Smoke (ASTM D2843): Pass (less than 75 percent).
  - 4. Surface-Burning Characteristics (ASTM E84): IBC Interior Finish Class B and NFPA Interior Finish Class 2.
    - a. Flame-Spread Index: 75 or less.
    - b. Smoke-Generated Index: 450 or less.
- B. Mock-Ups:
  - 1. Build Mock-Ups to verify selections made under Sample submittals and to demonstrate aesthetic effects.
  - 2. Build Mock-Up of each type of sheet resin fabrications.
  - 3. Approved Mock-Ups may become part of the completed Work if undisturbed at time of Substantial Completion.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Do not deliver Sheet Resin Fabrications components and accessories to Project site until areas are ready for installation
- B. Handle materials to prevent damage to finished surfaces.
  - 1. Provide protective coverings to prevent damage or staining following installation for duration of project.
- C. Before installing, permit materials to reach room temperature.

**1.05 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not install Sheet Resin Fabrications until spaces are enclosed and weatherproof, and ambient temperatures and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

**PART 2 - PRODUCTS****2.01 MATERIALS**

- A. Resin Sheet: Engineered polyester resin, glycol-modified.
  - 1. Thickness(es):
    - a. Field-Fabricated Lighted Panel: Field+Ghost, a 6.3mm-thick translucent layer factory-laminated to a 1/4-inch-thick decorative panel.
    - b. Prefabricated Dividers / Privacy Panels at Clerk Stations and between Corridor and Main Waiting Area: 1/2 inch.
    - c. Prefabricated Sliding Panels at Clerk Stations: 3/8 inch.
  - 2. Finish(es): See Drawings.
- B. Interlayer Materials: Compatible with polyester and bonding process to create a monolithic sheet of material when complete.
- C. Prefabricated Dividers / Privacy Panels: Partition (200.25) with minimal-appearance hardware in top-supported configuration.
  - 1) Metal Finish: Clear-anodized aluminum.
- D. Prefabricated Framed Sliding Panels: Slide 05 (100.06) header-mounted bypassing panel with fixed sidelight, weight borne at the header, with floor guide but no visible floor track.
  - 1) Where indicated, provide two units in one track in a bi-parting configuration.
  - 2) Deadlock: 3-15-4446-K. One per wall opening.
    - a. Cylinder: 3-15-4450-K.
  - 3) Door Receiver Plate Kit: 3-15-0024-K. One per deadlock.
    - a. Typical for bi-parting configuration.
    - b. When panels are not in a bi-parting configuration, mount receiver plate in supplemental extruded-aluminum jamb anchored to wall studs and projecting beyond stone finish on wall. Width of meeting face and finish of supplemental jamb shall match leading edge of sliding panel.
  - 4) Metal Finish: Clear-anodized aluminum.

**2.02 FABRICATION**

- A. General: Fabricate to designs, sizes, and thicknesses indicated and to comply with indicated standards.
  - 1. Sizes, profiles, and other characteristics are indicated on the Drawings.
- B. Comply with manufacturer's written recommendations for fabrication.
- C. Machining: Ensure that material is not chipped or warped by machining operations.
- D. Forming: As indicated on the Drawings. Comply with manufacturer's written instructions.
- E. Laminating: Laminate to substrates indicated using adhesives and techniques recommended by manufacturer.
- F. Tolerance: Maximum deflection of 1/16 inch over 12 inches.

**2.03 MISCELLANEOUS MATERIALS**

- A. General: Provide products of material, size, and shape required for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
  - 1. Mounting Hardware: As recommended by the sheet resin manufacturer.
- B. Cleaner: Type recommended by manufacturer.
- C. Fasteners: Use screws designed specifically for plastics.
  - 1. Self-threading screws are acceptable for permanent installations.
- D. Bonding Cements: Solvent or adhesives, suitable for use with product and application.
- E. Drilled-Panel Wall Anchors: Manufacturer's recommended wall anchor.
  - 1. Provide extensions to accommodate thicknesses scheduled or illustrated.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions where installation of sheet resin fabrications will occur, with Installer present, for compliance with manufacturer's requirements.
  - 1. Verify that substrates and conditions are satisfactory for installation and comply with requirements specified.

**3.02 INSTALLATION**

- A. General: Comply with manufacturer's written instructions.
- B. Shop-fabricate items to the greatest degree possible.
- C. Utilize fasteners, adhesives, and bonding agents recommended by manufacturer for type of installation indicated.
  - 1. Material that is chipped, warped, hazed, or discolored as a result of installation or fabrication methods will be rejected.
- D. Install components plumb, level, and rigid, scribed to adjacent finishes, in accordance with approved Shop Drawings and Product Data.
- E. Form field joints using manufacturer's recommended procedures.
  - 1. Locate seams in panels so that they are not directly in line with seams in substrates.

**3.03 CLEANING AND PROTECTION**

- A. Protect surfaces from damage.
  - 1. Replace damaged work that cannot be repaired to COR's satisfaction.

- - - END - - -





**SECTION 07 21 13  
THERMAL INSULATION**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies acoustical insulation for buildings.
- B. Acoustical insulation is identified by thickness and words "Acoustical Insulation".

**1.2 RELATED WORK (NOT USED)**

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
  - 1. Insulation
  - 2. Adhesive.
  - 3. Tape

**1.4 STORAGE AND HANDLING:**

- A. Store insulation materials in weathertight enclosure.
- B. Protect insulation from damage from handling, weather, and construction operations before, during, and after installation.

**1.5 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - C665-06.....Mineral Fiber Blanket Thermal Insulation for  
Light Frame Construction and Manufactured  
Housing
  - E84-10.....Surface Burning Characteristics of Building  
Materials

**PART 2 - PRODUCTS**

**2.1 INSULATION - GENERAL:**

- A. Use the thickness shown on the drawings.
- D. Insulation Products shall comply with following minimum content standards for recovered materials:

Material Type	Percent by Weight
Rock wool material	75 percent recovered material

The minimum-content standards are based on the weight (not the volume) of the material in the insulating core only.

**2.2 MASONRY CAVITY WALL INSULATION (NOT USED)**

**2.3 PERIMETER INSULATION IN CONTACT WITH SOIL (NOT USED)**

**2.4 EXTERIOR FRAMING OR FURRING INSULATION (NOT USED)**

**2.5 ACOUSTICAL INSULATION:**

A. Mineral Fiber Batt: ASTM C665. Maximum flame spread of 25 and smoke development of 450 when tested in accordance with ASTM E84.

B. Thickness as shown; of widths and lengths to fit tight against framing.

**2.6 SOUND DEADENING BOARD (NOT USED)**

**2.7 RIGID INSULATION (NOT USED)**

**2.8 MASONRY FILL INSULATION (NOT USED)**

**2.9 FASTENERS (NOT USED)**

**2.10 ADHESIVE:**

A. As recommended by the manufacturer of the insulation.

**2.11 TAPE:**

A. Pressure-sensitive adhesive on one face.

B. Perm rating of not more than 0.50.

**PART 3 - EXECUTION**

**3.1 INSTALLATION - GENERAL**

A. Install batt or blanket insulation with tight joints and filling framing void completely. Seal cuts, tears, and unlapped joints with tape.

B. Fit insulation tight against adjoining construction and penetrations, unless specified otherwise.

**3.2 MASONRY CAVITY WALLS (NOT USED)**

**3.3 PERIMETER INSULATION (NOT USED)**

**3.4 EXTERIOR FRAMING OR FURRING BLANKET INSULATION (NOT USED)**

**3.5 RIGID INSULATION ON SURFACE OF EXTERIOR WALLS, FLOORS, AND UNDERSIDE OF FLOORS (NOT USED)**

**3.6 MASONRY FILL INSULATION (NOT USED)**

**3.7 ACOUSTICAL INSULATION:**

A. Fasten blanket insulation between metal studs and wall furring with continuous pressure sensitive tape along edges or adhesive.

B. Pack insulation around door frames and windows and in cracks, expansion joints, control joints, door soffits and other voids. Pack behind outlets, around pipes, ducts, and services encased in wall or

partition. Hold insulation in place with pressure-sensitive tape or adhesive.

- C. Do not compress insulation below required thickness except where embedded items prevent required thickness.

- - - E N D - - -



**SECTION 07 84 00  
FIRESTOPPING**

**PART 1 GENERAL**

**1.1 DESCRIPTION:**

- A. Provide UL or equivalent approved firestopping system for the closures of openings in walls and floors against penetration of flame, heat, and smoke or gases in fireresistance-rated construction.
- B. Provide UL or equivalent approved firestopping system for the closure of openings in walls against penetration of gases or smoke in smoke partitions.

**1.2 RELATED WORK:**

- A. Sealants and application: Section 07 92 00, JOINT SEALANTS.
- B. Fire and smoke damper assemblies in ductwork: Section 23 31 00, HVAC DUCTS AND CASINGS.

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- C. Installer qualifications.
- D. Inspector qualifications.
- E. Manufacturers literature, data, and installation instructions for types of firestopping and smoke stopping used.
- F. List of FM, UL, or WH classification number of systems installed.
- G. Certified laboratory test reports for ASTM E814 tests for systems not listed by FM, UL, or WH proposed for use.
- H. Submit certificates from manufacturer attesting that firestopping materials comply with the specified requirements.

**1.4 DELIVERY AND STORAGE:**

- A. Deliver materials in their original unopened containers with manufacturer's name and product identification.
- B. Store in a location providing protection from damage and exposure to the elements.

**1.5 QUALITY ASSURANCE:**

- A. FM, UL, or WH or other approved laboratory tested products will be acceptable.
- B. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991 or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements." Submit qualification data.

- C. **Inspector Qualifications:** Contractor shall engage a qualified inspector to perform inspections and final reports. The inspector shall meet the criteria contained in ASTM E699 for agencies involved in quality assurance and shall have a minimum of two years' experience in construction field inspections of firestopping systems, products, and assemblies. The inspector shall be completely independent of, and divested from, the Contractor, the installer, the manufacturer, and the supplier of material or item being inspected. Submit inspector qualifications.

#### **1.6 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. ASTM International (ASTM):
- E84-14.....Surface Burning Characteristics of Building Materials
  - E699-09.....Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components
  - E814-13a.....Fire Tests of Through-Penetration Fire Stops
  - E2174-14.....Standard Practice for On-Site Inspection of Installed Firestops
  - E2393-10a.....Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers
- C. FM Global (FM):
- Annual Issue Approval Guide Building Materials
  - 4991-13.....Approval of Firestop Contractors
- D. Underwriters Laboratories, Inc. (UL):
- Annual Issue Building Materials Directory
  - Annual Issue Fire Resistance Directory
  - 723-10(2008).....Standard for Test for Surface Burning Characteristics of Building Materials
  - 1479-04(R2014).....Fire Tests of Through-Penetration Firestops
- E. Intertek Testing Services - Warnock Hersey (ITS-WH):
- Annual Issue Certification Listings

**PART 2 - PRODUCTS****2.1 FIRESTOP SYSTEMS:**

- A. Provide either factory-built firestop devices or field-erected through-penetration firestop systems to form a specific building system maintaining required integrity of the fire barrier and stop the passage of gases or smoke. Firestop systems shall accommodate building movements without impairing their integrity.
  - 1. Fireresistance- and/or smoke-rated partitions and corridor partitions shall extend from the finished floor to where they may be sealed tight, such as the underside of the structure or deck above. Penetrations through such partitions shall be sealed per the appropriate approved, tested, and rated design assembly for the wall rating designated.
  - 2. In new construction or conditions requiring existing construction to be removed, all penetrations through floor slabs such as piping, conduits, ducts, pneumatic tubes, and the like, shall be sealed with an approved, tested, and rated design assembly, in accordance with the applicable details.
- B. Through-penetration firestop systems and firestop devices tested in accordance with ASTM E814 or UL 1479 using the "F" or "T" rating shall maintain the same rating and integrity as the fire barrier being sealed. "T" ratings are not required for penetrations smaller than or equal to 101 mm (4 in.) nominal pipe or 0.01 sq. m (16 sq. in.) in overall cross sectional area.
- C. Products requiring heat activation to seal an opening by its intumescence are not permitted by VA Fire and Safety for use in firestop systems.
- D. Firestop sealants used for firestopping or smoke sealing shall have the following properties:
  - 1. Contain no flammable or toxic solvents.
  - 2. Release no dangerous or flammable out gassing during the drying or curing of products.
  - 3. Water-resistant after drying or curing and unaffected by high humidity, condensation, or transient water exposure.
  - 4. When installed in exposed areas, capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

- E. Firestopping system or devices used for penetrations by glass pipe, plastic pipe or conduits, unenclosed cables, or other non-metallic materials shall have following properties:
  - 1. Classified for use with the particular type of penetrating material used.
  - 2. Penetrations containing loose electrical cables, computer data cables, and communications cables protected using firestopping systems that allow unrestricted cable changes without damage to the seal.
- F. Maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E84 or UL 723. Material shall be an approved firestopping material as listed in UL Fire Resistance Directory or by a nationally recognized testing laboratory.
- G. FM, UL, or WH rated or tested by an approved laboratory in accordance with ASTM E814.
- H. Materials shall be nontoxic and noncarcinogen at all stages of application or during fire conditions and shall not contain hazardous chemicals. Provide firestop material that is free from ethylene glycol, PCB, MEK, and asbestos.
- I. For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
  - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
  - 2. For floor penetrations with annular spaces exceeding 101 mm (4 in.) or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means acceptable to the firestop manufacturer.
  - 3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- I. Provide approved, tested, and rated putty pads on the back of all steel wall boxes located closer than 24 inches on center to each other in rated walls. See G-Series Drawings for accepted assemblies. Install per manufacturer's instructions.

## **2.2 SMOKE STOPPING IN SMOKE PARTITIONS:**

- A. In fully sprinklered group I-2 occupancies, the corridor partitions shall be made to resist the passage of smoke, or be 'smoke tight'.



These partitions shall extend from the finished floor to where they may be sealed tight, such as the underside of the structure or deck above. Partitions and any penetrations shall be sealed tight with drywall compound or sealant.

- B. Provide silicone sealant in smoke partitions as specified in Section 07 92 00, JOINT SEALANTS.
- C. Provide mineral fiber filler and bond breaker behind sealant.
- D. Sealants shall have a maximum flame spread of 25 and smoke developed of 50 when tested in accordance with ASTM E84.
- E. When used in exposed areas capable of being sanded and finished with similar surface treatments as used on the surrounding wall or floor surface.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION:**

- A. Submit product data and installation instructions, as required by article, submittals, after an on-site examination of areas to receive firestopping.
- B. Examine substrates and conditions with installer present for compliance with requirements for opening configuration, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Existing fire rated walls and smoke tight walls within the limits of construction shall be inspected to ensure the following:
  - 1. Partition shall extend and be tight to and sealed off from the bottom and to the deck or structure above.
  - 2. Penetrations and holes through walls shall be repaired/patched in accordance with the applicable details.
- D. In general, existing rated walls are assumed to extend to the underside of the deck or structure, and when discovered not to be doing so, shall be extended as follows:
  - 1. At Non-Load-Bearing Concrete Masonry Units (CMUs): Walls having 4-inch-thick solid masonry or 8-inch-thick CMU (D-2) at one- or two-hour fireresistance-rated wall shall be extended up to within 2 inches below the structure above, and shall be filled at the top with a UL-rated assembly for the hourly rating required.

2. At One-Hour Fireresistance-Rated Plaster/Drywall Partitions: use 4-inch-deep metal studs with 5/8-inch-thick fireresistance-rated gypsum board at each side.
3. At Two-Hour Fireresistance-Rated Plaster/Drywall Partitions: Use 4-inch-deep metal studs with two layers of 5/8-inch-thick rated gypsum board at each side.
4. Upon completion of the fireresistance- or smoke-rated wall upgrade, patch and repair and install new wall, floor, and ceiling finishes as required.

### **3.2 PREPARATION:**

- A. Remove dirt, grease, oil, laitance and form-release agents from concrete, loose materials, or other substances that prevent adherence and bonding or application of the firestopping or smoke stopping materials.
- B. Remove insulation on insulated pipe for a distance of 150 mm (6 inches) on each side of the fireresistance-rated assembly prior to applying the firestopping materials unless the firestopping materials are tested and approved for use on insulated pipes.
- C. Prime substrates where required by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- D. Masking Tape: Apply masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing seal of firestopping with substrates.

### **3.3 INSTALLATION:**

- A. Do not begin firestopping work until the specified material data and installation instructions of the proposed firestopping systems have been submitted and approved.
- B. Install firestopping systems with smoke stopping in accordance with FM, UL, WH, or other approved system details and installation instructions.
  1. See standard fireresistance-rated/smoke wall and penetration details sheet included on the Drawings.
  2. Devices contained in metallic boxes in fireresistance-rated wall openings of two hours or less, not exceeding 16 square inches, are

permitted provided the area of such openings does not aggregate more than 100 square inches for any 100 square feet of fire-resistant wall area. The gypsum board face shall be cut closely to the box so that the clearance from the box does not exceed 1/8 inch. Boxes on opposite sides of the fire-resistance-rated wall shall be separated by a horizontal distance of not less than 24 inches, or be completely covered with putty pads per the approved, tested, and rated design assembly.

C. Install smoke stopping seals in smoke partitions.

#### **3.4 CLEAN-UP:**

- A. As work on each floor is completed, remove materials, litter, and debris.
- B. Clean up spills of liquid-type materials.
- C. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.
- D. Protect firestopping 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 firestopping immediately and install new materials to provide firestopping complying with specified requirements.

#### **3.5 INSPECTIONS AND ACCEPTANCE OF WORK:**

- A. Do not conceal or enclose firestop assemblies until inspection is complete and approved by the Contracting Officer Representative (COR).
- B. Furnish service of approved inspector to inspect firestopping in accordance with ASTM E2393 and ASTM E2174 for firestop inspection, and document inspection results. Submit written reports indicating locations of and types of penetrations and type of firestopping used at each location; type shall be recorded by UL-listed printed numbers.

- - - E N D - - -



**SECTION 07 92 00  
JOINT SEALANTS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section covers interior sealant and its application, wherever required for complete installation of building materials or systems.

**1.2 RELATED WORK (INCLUDING BUT NOT LIMITED TO THE FOLLOWING):**

- A. Firestopping Penetrations: Section 07 84 00, FIRESTOPPING.
- B. Glazing: Section 08 80 00, GLAZING.
- C. Sound-Rated Gypsum Partitions/Sound Sealants: Section 09 29 00, GYPSUM BOARD.
- D. Mechanical Work: Section 21 05 11, COMMON WORK RESULTS FOR FIRE SUPPRESSION; Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING; and Section 23 05 11, COMMON WORK RESULTS FOR HVAC AND STEAM GENERATION.

**1.3 QUALITY ASSURANCE:**

- A. Installer Qualifications: An experienced installer with a minimum of three (3) years' experience and who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance. Submit qualification.
- B. Source Limitations: Obtain each type of joint sealant through one (1) source from a single manufacturer.
- C. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.
  - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
  - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
  - 3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
- D. Lab Tests: Submit samples of materials that will be in contact or affect joint sealants to joint sealant manufacturers for tests as follows:
  - 1. Adhesion Testing: Before installing elastomeric sealants, test their adhesion to protect joint substrates according to the method in

- ASTM C794 to determine if primer or other specific joint preparation techniques are required.
2. Compatibility Testing: Before installing elastomeric sealants, determine compatibility when in contact with glazing and gasket materials.
  3. Stain Testing: Perform testing per ASTM C1248 on interior sealants to determine if sealants or primers will stain adjacent surfaces. No sealant work is to start until results of these tests have been submitted to the Contracting Officer Representative (COR) and the COR has given written approval to proceed with the work.
- E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field-test their adhesion to joint substrates according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.
1. Conduct field tests for each application indicated below:
    - a. Each type of elastomeric sealant and joint substrate indicated.
    - b. Each type of non-elastomeric sealant and joint substrate indicated.
- F. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections and to demonstrate aesthetic effects and qualities of materials and execution: //
1. Joints in mockups of assemblies that are indicated to receive elastomeric joint sealants.

#### **1.4 CERTIFICATION:**

- A. Contractor shall submit to the COR written certification that joints are of the proper size and design, that the materials supplied are compatible with adjacent materials and backing, that the materials will properly perform to provide permanent watertight, airtight or vapor tight seals (as applicable), and that materials supplied meet specified performance requirements.

#### **1.5 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Installer qualifications.
- C. Contractor certification.
- D. Manufacturer's installation instructions for each product used.
- E. Cured samples of exposed sealants for each color.
- F. Manufacturer's Literature and Data:

1. Primers
2. Sealing compound, each type, including compatibility when different sealants are in contact with each other.

G. Manufacturer warranty.

#### **1.6 PROJECT CONDITIONS:**

A. Environmental Limitations:

1. Do not proceed with installation of joint sealants under following conditions:
  - a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C (40 degrees F).
  - b. When joint substrates are wet.

B. Joint-Width Conditions:

1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:

1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

#### **1.7 DELIVERY, HANDLING, AND STORAGE:**

- A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.
- B. Carefully handle and store to prevent inclusion of foreign materials.
- C. Do not subject to sustained temperatures exceeding 32 degrees C (90 degrees F) or less than 5 degrees C (40 degrees F).

#### **1.8 DEFINITIONS:**

- A. Definitions of terms in accordance with ASTM C717 and as specified.
- B. Backing Rod: A type of sealant backing.
- C. Bond Breakers: A type of sealant backing.
- D. Filler: A sealant backing used behind a back-up rod.

#### **1.9 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their sealant for a minimum of five (5) years from the date of installation and final acceptance by the Government. Submit manufacturer warranty.

**1.10 APPLICABLE PUBLICATIONS:**

A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

B. ASTM International (ASTM):

C509-06.....Elastomeric Cellular Preformed Gasket and  
Sealing Material

C612-14.....Mineral Fiber Block and Board Thermal  
Insulation

C717-14a.....Standard Terminology of Building Seals and  
Sealants

C734-06(R2012).....Test Method for Low-Temperature Flexibility of  
Latex Sealants after Artificial Weathering

C794-10.....Test Method for Adhesion-in-Peel of Elastomeric  
Joint Sealants

C919-12.....Use of Sealants in Acoustical Applications.

C920-14a.....Elastomeric Joint Sealants.

C1021-08(R2014).....Laboratories Engaged in Testing of Building  
Sealants

C1193-13.....Standard Guide for Use of Joint Sealants.

C1248-08(R2012).....Test Method for Staining of Porous Substrate by  
Joint Sealants

C1330-02(R2013).....Cylindrical Sealant Backing for Use with Cold  
Liquid Applied Sealants

C1521-13.....Standard Practice for Evaluating Adhesion of  
Installed Weatherproofing Sealant Joints

D217-10.....Test Methods for Cone Penetration of  
Lubricating Grease

D1056-14.....Specification for Flexible Cellular Materials—  
Sponge or Expanded Rubber

E84-09.....Surface Burning Characteristics of Building  
Materials

C. Sealant, Waterproofing and Restoration Institute (SWRI).  
The Professionals' Guide

D. Environmental Protection Agency (EPA):

40 CFR 59(2014).....National Volatile Organic Compound Emission  
Standards for Consumer and Commercial Products



**PART 2 - PRODUCTS****2.1 SEALANTS:****A. Interior Sealants:**

1. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system are to comply with the following limits for VOC content when calculated according to 40 CFR 59, (EPA Method 24):
  - a. Architectural Sealants: 250 g/L.
  - b. Sealant Primers for Nonporous Substrates: 250 g/L.
  - c. Sealant Primers for Porous Substrates: 775 g/L.
2. S-# Vertical and Horizontal Surfaces: ASTM C920, Type S or M, Grade NS, Class 25, Use NT.
3. Provide location(s) of interior sealant as follows:
  - a. Typical narrow joint 6 mm, (1/4 inch) or less at walls and adjacent components.
  - b. Interior surfaces of exterior wall penetrations.
  - c. Joints at exterior walls.
  - d. Exposed isolation joints at top of full height walls.
  - e. Joints formed where nonplanar tile surfaces meet.
  - f. Joints between tile and dissimilar materials; joints occurring where substrates change.
  - g. Behind escutcheon plates at valve pipe penetrations and showerheads in showers.

**B. Acoustical Sealant:**

1. Conforming to ASTM C919; flame spread of 25 or less; and a smoke developed rating of 50 or less when tested in accordance with ASTM E84. Acoustical sealant shall have a consistency of 250 to 310 when tested in accordance with ASTM D217; remain flexible and adhesive after 500 hours of accelerated weathering as specified in ASTM C734; and be non-staining.
2. Provide location(s) of acoustical sealant as follows:
  - a. Exposed acoustical joint at sound-rated partitions.
  - b. Concealed acoustic joints at sound-rated partitions.
  - c. Joints where item pass-through sound-rated partitions.

**2.2 COLOR:**

- A. Sealants used with unpainted concrete are to match color of adjacent concrete.

- B. Color of sealants for other locations to be light gray or aluminum, unless otherwise indicated in Construction Documents.

### **2.3 JOINT SEALANT BACKING:**

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
  - 1. Type C: Closed-cell material with a surface skin.
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056 or synthetic rubber (ASTM C509), nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 32 degrees C (minus 26 degrees F). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

### **2.4 WEEPS (NOT USED)**

### **2.5 FILLER:**

- A. Mineral Fiberboard: ASTM C612, Class 1.
- B. Thickness same as joint width.
- C. Depth to fill void completely behind back-up rod.

### **2.6 PRIMER:**

- A. As recommended by manufacturer of caulking or sealant material.
- B. Stain-free type.

### **2.7 CLEANERS-NON POROUS SURFACES:**

- A. Chemical cleaners compatible with sealant and acceptable to manufacturer of sealants and sealant backing material. Cleaners shall be free of oily residues and other substances capable of staining or harming joint substrates and adjacent non-porous surfaces and formulated to promote adhesion of sealant and substrates.

**PART 3 - EXECUTION****3.1 INSPECTION:**

- A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.
- B. Coordinate for repair and resolution of unsound substrate materials.
- C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

**3.2 PREPARATIONS:**

- A. Prepare joints in accordance with manufacturer's instructions and SWRI (The Professionals' Guide).
- B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
  - 1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
  - 2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include - but are not limited to - the following:
    - a. Concrete.
    - b. Unglazed surfaces of ceramic tile.
  - 3. Remove laitance and form-release agents from concrete.
  - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous surfaces include but are not limited to the following:
    - a. Metal.
    - b. Glass.
    - c. Porcelain enamel.
    - d. Glazed surfaces of ceramic tile.
- C. Do not cut or damage joint edges.
- D. Apply non-staining masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.

3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions or as indicated by pre-construction joint sealant substrate test.
  1. Apply primer prior to installation of back-up rod or bond breaker tape.
  2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.

### **3.3 BACKING INSTALLATION:**

- A. Install backing material, to form joints enclosed on three sides as required for specified depth of sealant.
- B. Where deep joints occur, install filler to fill space behind the backing rod and position the rod at proper depth.
- C. Cut fillers installed by others to proper depth for installation of backing rod and sealants.
- D. Install backing rod, without puncturing the material, to a uniform depth, within plus or minus 3 mm (1/8 inch) for sealant depths specified.
- E. Where space for backing rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

### **3.4 SEALANT DEPTHS AND GEOMETRY:**

- A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.
- B. At widths over 6 mm (1/4 inch), sealant depth one half of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately one half of depth at adhesion surface.

### **3.5 INSTALLATION:**

- A. General:
  1. Apply sealants and caulking only when ambient temperature is between 5 degrees C and 38 degrees C (40 degrees and 100 degrees F).
  2. Do not install polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.
  3. Do not install sealant type listed by manufacture as not suitable for use in locations specified.

4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
  5. Avoid dropping or smearing compound on adjacent surfaces.
  6. Fill joints solidly with compound and finish compound smooth.
  7. Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C1193 unless shown or specified otherwise in construction documents. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Remove any excess sealant from adjacent surfaces of joint, leaving the work in a clean finished condition.
  8. Finish floor joints flush unless joint is otherwise detailed.
  9. Apply compounds with nozzle size to fit joint width.
  10. Test sealants for compatibility with each other and substrate. Use only compatible sealant. Submit test reports.
  11. Replace sealant which is damaged during construction process.
- B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.
- C. Interior Sealants: Where gypsum board partitions are of sound-rated, fireresistance-rated, or smoke barrier construction, follow requirements of ASTM C919 only to seal all cut-outs and intersections with the adjoining construction unless specified otherwise.
1. Apply a 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.
  2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
  3. Partition Intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
  4. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all cutouts to seal openings of electrical boxes, ducts, pipes, and similar penetrations. To seal electrical boxes, seal sides and backs.
  5. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

### 3.6 FIELD QUALITY CONTROL (NOT USED)

### 3.7 CLEANING:

- A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by manufacturer of the adjacent material or if not otherwise indicated by the caulking or sealant manufacturer.
- B. Leave adjacent surfaces in a clean and unstained condition.

- - - E N D - - -

## OPENING LIST

## Mountain Home VA Medical Center - Building 160

<u>Opening</u>	<u>Hdw Set</u>	<u>Opening</u>	<u>Hdw Set</u>	<u>Opening</u>	<u>Hdw Set</u>
P4C1	2.0	P4202	9.0	P4409	9.0
P4C2	3.0	P4203	9.0	P4410	9.0
P4C3	15.0	P4204	9.0	P4411	9.0
P4C4	17.0	P4205	9.0	P4412	9.0
P4C4A	17.0	P4206	9.0	P4413	10.0
P4C4B	22.0	P4207	17.0	P4414	10.0
P4C6	1.0	P4208	9.0		
P4C6A	1.0	P4209	9.0		
P4C7	18.0	P4210	8.0		
P4C9	15.0	P4211	9.0		
P4C11	18.0	P4213	9.0		
P4C12	4.0	P4214	8.0		
P4C13	21.0	P4215	14.0		
P4C16	1.0	P4216	8.0		
P4C16A	1.0	P4300	18.0		
P4C21	1.0	P4301	6.0		
P4C21A	1.0	P4302	8.0		
P4000	17.0	P4303	20.0		
P4100	12.0	P4304	9.0		
P4100A	12.0	P4305	9.0		
P4101	22.0	P4306	20.0		
P4102	11.0	P4307	8.0		
P4102A	11.0	P4308	10.0		
P4103	9.0	P4309	9.0		
P4104	9.0	P4310	9.0		
P4105	9.0	P4311	9.0		
P4106	6.0	P4312	9.0		
P4107	9.0	P4313	9.0		
P4108	9.0	P4314	9.0		
P4109	9.0	P4315	9.0		
P4110	9.0	P4316	22.0		
P4111	9.0	P4317	9.0		
P4112	16.0	P4318	9.0		
P4113	7.0	P4319	13.0		
P4114	9.0	P4320	19.0		
P4115	9.0	P4321	9.0		
P4117	9.0	P4322	7.0		
P4118	13.0	P4323	9.0		
P4118A	13.0	P4324	14.0		
P4119	9.0	P4324A	14.0		
P4120	8.0	P4325	10.0		
P4121	9.0	P4326	19.0		
P4122	8.0	P4327	10.0		
P4123	9.0	P4328	9.0		
P4124	8.0	P4400	9.0		
P4125	9.0	P4401	9.0		
P4126	13.0	P4402	9.0		
P4126A	13.0	P4403	9.0		
P4128	8.0	P4404	9.0		
P4128A	19.0	P4405	9.0		
P4130	22.0	P4406	9.0		
P4201	9.0	P4407	9.0		
		P4408	8.0		





**SECTION 08 06 71**  
**DOOR HARDWARE SCHEDULE**

HW SET # 1.0

Hinge		US32D	MK
1 Classroom Lock	CRR 8808FL LC	630	YA
1 Door Closer	4420	689	YA
1 Kick Plate	K1050	US32D	RO
1 Threshold	2005AT		PE
1 Set Door Seals	303AS		PE
1 Door Bottom Sweep	3452CNB		PE

NOTE: CYLINDER ON CORRIDOR SIDE OF OPENING.

HW SET # 2.0

2 Continuous Hinge	HG305	630	MR
1 Delayed Egress Lock	IMXDA		SU
2 SVR Fire Exit Device	7170F LBR EO	630	YA
1 Cylinder	AS REQUIRED	626	00
2 Door Closer	PR4400	689	YA
2 Kick Plate	K1050	US32D	RO
2 Electromagnetic Holder	990 SERIES	689	RF
1 Set Door Seals	S88D		PE
2 Astragal	357SS x S88D		PE
1 Card Reader	FURNISHED IN OTHER SECTION		00
1 Power Supply	AS REQUIRED		SU
1 Wiring Diagram			00

OPERATION: DOORS TO BE CLOSED AND LOCKED (SECURE LEAF) AT ALL TIMES.  
PRESENTATION OF A VALID CARD RELEASES DELAY EGRESS LOCK ALLOWING  
INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR. DELAY EGRESS  
LOCK TO BE TIED INTO FIRE ALARM SYSTEM.

HW SET # 3.0

2 Continuous Hinge	HG305	630	MR
2 SVR Fire Exit Device	7170F LBR EO	630	YA
2 Door Closer	PR4400	689	YA
2 Kick Plate	K1050	US32D	RO
2 Door Stop		US32D	RO
1 Set Door Seals	S88D		PE
2 Astragal	357SS x S88D		PE

HW SET # 4.0

2 Continuous Hinge	HG305	630	MR
2 SVR Fire Exit Device	7170F LBR EO	630	YA
2 Door Closer	PR4400	689	YA
2 Kick Plate	K1050	US32D	RO
2 Electromagnetic Holder	990 SERIES	689	RF
1 Set Door Seals	S88D		PE
2 Astragal	357SS x S88D		PE

NOTE: ELECTROMAGNETIC HOLDERS TO BE TIED INTO FIRE ALARM SYSTEM.

HW SET # 5.0 (NOT USED)

<del>Hinge</del>		<del>US26D</del>	<del>MK</del>
<del>1 Privacy Lock w/Indicator</del>	<del>CRR 8840FL IND LC</del>	<del>630</del>	<del>YA</del>
<del>1 Cylinder</del>	<del>AS REQUIRED</del>	<del>626</del>	<del>00</del>
<del>1 Electric Strike</del>	<del>1006DB x MODE 2</del>	<del>630</del>	<del>HS</del>
<del>1 SMART Pac Bridge Rectifier</del>	<del>2005M3</del>		<del>HS</del>
<del>1 Automatic Operator</del>	<del>FURNISHED IN OTHER SECTION</del>		<del>00</del>
<del>2 Door Switch</del>	<del>FURNISHED IN OTHER SECTION</del>		<del>00</del>
<del>1 Kick Plate</del>	<del>K1050</del>	<del>US32D</del>	<del>RO</del>
<del>1 Door Stop</del>		<del>US32D</del>	<del>RO</del>
<del>1 Set Door Seals</del>	<del>S88D</del>		<del>PE</del>
<del>1 Card Reader</del>	<del>FURNISHED IN OTHER SECTION</del>		<del>00</del>
<del>1 Power Supply</del>	<del>AS REQUIRED</del>		<del>SU</del>
<del>1 Wiring Diagram</del>			<del>00</del>

~~OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD RELEASES ELECTRIC STRIKE AND ACTIVATES AUTOMATIC OPERATOR ALLOWING INGRESS WHEN DEADBOLT IS IN THE RETRACTED POSITION. EGRESS AT ALL TIMES BY INSIDE LEVER OR DOOR SWITCH. THE ELECTRIC STRIKE WILL NOT RELEASE IF THE DEADBOLT IS EXTENDED.~~

HW SET # 6.0

Hinge		US26D	MK
1 Storeroom Lock	CRR 8805FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Electric Strike	1006-LBM	630	HS
1 SMART Pac Bridge Rectifier	2005M3		HS
1 Door Closer	4400	689	YA
1 Kick Plate	K1050	US32D	RO
1 Door Stop		US32D	RO
1 Set Door Seals/Silencers			PE
1 Card Reader	FURNISHED IN OTHER SECTION		00
1 Power Supply	AS REQUIRED		SU
1 Wiring Diagram			00

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF A VALID CARD RELEASES ELECTRIC STRIKE ALLOWING INGRESS. EGRESS AT ALL TIMES BY INSIDE LEVER.

#### HW SET # 7.0

Hinge		US26D	MK
1 Privacy Lock w/Indicator	CRR 8840FL IND LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	4400	689	YA
1 Kick Plate	K1050	US32D	RO
1 Door Stop		US32D	RO
1 Set Door Seals/Silencers	AS REQUIRED		PE

#### HW SET # 8.0

1 Continuous Hinge	HT DSHP01C x LAR		PE
1 Privacy Set w/Indicator	CRR 8802FL IND	630	YA
1 Overhead Stop	2-X36	630	RF
2 Mop Plate	K1050	US32D	RO
1 Emergency Stop	ERS84C-NPLxHT		PE
1 Double Lip Strike	DLS-8	US26D	MK

#### HW SET # 9.0

Hinge		US26D	MK
1 Office Lock	CRR 8807FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Stop		US32D	RO
3 Silencer			RO

#### HW SET # 10.0

Hinge		US26D	MK
1 Office Lock	CRR 8807FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Overhead Stop	10-X36	630	RF
3 Silencer			RO

#### HW SET # 11.0

Hinge		US26D	MK
1 Office Lock	CRR 8807FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	4400	689	YA
1 Kick Plate	K1050	US32D	RO
1 Door Stop		US32D	RO
1 Set Door Seals/Silencers	AS REQUIRED		PE

HW SET # 12.0

Hinge		US26D	MK
1 Office Lock	CRR 8807FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	4420	689	YA
1 Kick Plate	K1050	US32D	RO
1 Set Door Seals/Silencers			PE

HW SET # 13.0

1 Continuous Hinge	HT DSHP01C x LAR		PE
1 Classroom Lock	CRR 8808FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Overhead Stop	2-X36	630	RF
1 Emergency Stop	ERS84C-NPLxHT		PE
1 Double Lip Strike	DLS-8	US26D	MK

HW SET # 14.0

Hinge		US26D	MK
1 Office Lock	CRR 8807FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	4400	689	YA
1 Kick Plate	K1050	US32D	RO
1 Door Stop		US32D	RO
1 Set Door Seals/Silencers	AS REQUIRED		PE

HW SET # 15.0

Hinge		US26D	MK
1 Classroom Lock	CRR 8808FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	PR4400	689	YA
1 Kick Plate	K1050	US32D	RO
1 Electromagnetic Holder	990 SERIES	689	RF
1 Set Door Seals/Silencers	AS REQUIRED		PE

NOTE: ELECTROMAGNETIC HOLDER TO BE TIED INTO FIRE ALARM SYSTEM.

HW SET # 16.0

Hinge		US26D	MK
1 Storeroom Lock	CRR 8805FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Stop		US32D	RO
3 Silencer			RO

HW SET # 17.0

Hinge		US26D	MK
1 Storeroom Lock	CRR 8805FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	4400	689	YA
1 Kick Plate	K1050	US32D	RO
1 Door Stop		US32D	RO
1 Set Door Seals/Silencers	AS REQUIRED		PE

HW SET # 18.0

Hinge		US26D	MK
1 Storeroom Lock	CRR 8805FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	4420	689	YA
1 Kick Plate	K1050	US32D	RO
1 Set Door Seals/Silencers	AS REQUIRED		PE

HW SET # 19.0

Hinge		US26D	MK
2 Flush Bolt	555/557	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom Lock	CRR 8805FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
2 Overhead Stop	10-X36	630	RF
2 Silencer			RO

HW SET # 20.0

Hinge		US26D	MK
1 Set Combo Flush Bolts	2845/2945	US26D	RO
1 Dust Proof Strike	570	US26D	RO
1 Storeroom Lock	CRR 8805FL LC	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Coordinator	2600 x FILLER BAR x MTG BRKTS	Black	RO
2 Door Closer	4420	689	YA
2 Kick Plate	K1050	US32D	RO
1 Set Door Seals/Silencers	AS REQUIRED		PE

HW SET # 21.0

1 Elect Rim Fire Exit Device	7100F CR690F	630	YA
1 Cylinder	AS REQUIRED	626	00
1 Door Closer	4400	689	YA
1 Door Loop	TSB-C		SU
1 Card Reader	FURNISHED IN OTHER SECTION		00
1 Power Supply	BPS-24		SU
1 Wiring Diagram	WD-SYSPK		00

NOTE: REUSE BALANCE OF EXISTING HARDWARE.

OPERATION: DOOR TO BE CLOSED AND LOCKED AT ALL TIMES. PRESENTATION OF VALID CARD UNLOCKS OUTSIDE LEVER ALLOWING INGRESS. EGRESS AT ALL TIMES BY EXIT DEVICE PUSH BAR. ELECTRIFIED EXIT DEVICE TO BE TIED INTO FIRE ALARM SYSTEM.

NOTE: PROVIDE ADAPTER PLATES AS REQUIRED TO COVER EXISTING CUT-OUTS THAT ARE NOT USED. ANY RETROFIT OR OTHER FIELD MODIFICATION TO A FIRE-RATED OPENING CAN POTENTIALLY IMPACT THE FIRE RATING OF THE OPENING. WHEN RETROFITTING ANY PORTION OF AN EXISTING FIRE RATED OPENING AND INSTALLING A NEW FIRE-RATED OPENING, CONSULT WITH A LOCAL CODE OFFICIAL (AUTHORITY HAVING JURISDICTION) TO ENSURE COMPLIANCE WITH ALL APPLICABLE CODES AND RATINGS.

HW SET # 22.0

1 Cylinder	AS REQUIRED	626	00
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NOTE: EXISTING DOOR, FRAME AND HARDWARE TO REMAIN.

MANUFACTURERS ABBREVIATIONS:

1. MK - McKinney
2. MR - Markar
3. PE - Pemko
4. RO - Rockwood
5. YA - Yale
6. SU - Securitron
7. 00 - Other
8. HS - HES
9. RF - Rixson

- - - END - - -

**SECTION 08 11 13  
HOLLOW METAL DOORS AND FRAMES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies steel doors, steel frames, and related components.
- B. Terms relating to steel doors and frames as defined in ANSI A123.1 and as specified.

**1.2 RELATED WORK**

- A. Wood doors: Section 08 14 00, Interior Wood Doors.
- B. Door Hardware: Section 08 71 00, DOOR HARDWARE.
- C. Glazing: Section 08 80 00, GLAZING.
- D. Card readers and biometric devices: Section 28 13 00, PHYSICAL ACCESS CONTROL SYSTEM.

**1.3 TESTING**

- A. An independent testing laboratory shall perform testing.

**1.4 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturers Literature and Data:
  - 1. Fireresistance-rated doors and frames, showing conformance with NFPA 80 and Underwriters Laboratory, Inc., or Intertek Testing Services or Factory Mutual fireresistance rating requirements.

**1.5 SHIPMENT**

- A. Prior to shipment label each door and frame to show location, size, door swing, and other pertinent information.
- B. Fasten temporary steel spreaders across the bottom of each door frame.

**1.6 STORAGE AND HANDLING**

- A. Store doors and frames at the Project site under cover.
- B. Protect from rust and damage during storage and erection until completion.

**1.7 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. Door and Hardware Institute (DHI):
  - A115 Series.....Steel Door and Frame Preparation for Hardware, Series A115.1 through A115.17 (Dates Vary)

## C. Steel Door Institute (SDI):

113-01 (R2006).....Thermal Transmittance of Steel Door and Frame  
Assemblies

128-09.....Acoustical Performance for Steel Door and Frame  
Assemblies

## D. American National Standard Institute:

A250.8-2003 (R2008).....Specifications for Standard Steel Doors and  
Frames

## E. American Society for Testing and Materials (ASTM):

A167-99(R2009).....Stainless and Heat-Resisting Chromium-Nickel  
Steel Plate, Sheet, and Strip

A568/568-M-11.....Steel, Sheet, Carbon, and High-Strength, Low-  
alloy, Hot-Rolled and Cold-Rolled

A1008/A1008M-10.....Steel, sheet, Cold-Rolled, Carbon, Structural,  
High Strength Low Alloy and High Strength Low  
Alloy with Improved Formability

D1621-10.....Compressive Properties of Rigid Cellular  
Plastics

F. The National Association Architectural Metal Manufacturers (NAAMM):  
Metal Finishes Manual (AMP 500-06)

## G. National Fire Protection Association (NFPA):

80-13.....Fire Doors and Other Opening Protectives

## H. Underwriters Laboratories, Inc. (UL):

Fire Resistance Directory

## I. Intertek Testing Services (ITS):

Certifications Listings...Latest Edition

## J. Factory Mutual System (FM):

Approval Guide

**PART 2 - PRODUCTS****2.1 MATERIALS**

A. Stainless Steel: ASTM A167, Type 302 or 304; finish, NAAMM Number 4.

B. Sheet Steel: ASTM A1008/A1008M, cold-rolled for panels (face sheets) of  
doors.

C. Anchors, Fastenings and Accessories: Fastenings anchors, clips  
connecting members and sleeves from zinc coated steel.

D. Prime Paint: Paint that meets or exceeds the requirements of A250.8.

**2.2 FABRICATION GENERAL**

## A. GENERAL:



1. Follow ANSI A250.8 for fabrication of standard steel doors, except as specified otherwise. Doors to receive hardware specified in Section 08 71 00, DOOR HARDWARE. Comply with tolerances in ANSI A250.8. Thickness, 44 mm (1-3/4 inches), unless otherwise shown.
  2. When vertical steel stiffeners are used for core construction, fill spaces between stiffeners with mineral fiber insulation.
- B. Standard-Duty Doors: ANSI A250.8, Level 1, Full-flush seamless design of size and design shown.
- C. Heavy-Duty Doors: ANSI A250.8, Level 2, Full-flush seamless design of size and design shown. Core construction types a, d, or f.

Core Construction Type	Door Core Description
a	Kraft honeycomb
d	Unitized steel grid
f	Vertical steel stiffeners

- D. Smoke Doors:
1. Close top and vertical edges flush.
  2. Provide seamless vertical edges.
  3. Apply Steel astragal to the meeting stile at the active leaf of pair of doors or double egress doors.
  4. Provide clearance at head, jamb and sill as specified in NFPA 80.
- E. Fireresistance-Rated Doors (Labeled):
1. Conform to NFPA 80 when tested by Underwriters Laboratories, Inc., Inchcape Testing Services, or Factory Mutual for the class of door or door opening shown.
  2. Fireresistance-rated labels of metal, with raised or incised markings of approving laboratory shall be permanently attached to doors.
  3. Close top and vertical edges of doors flush. Vertical edges shall be seamless. Apply steel astragal to the meeting stile of the active leaf of pairs of fireresistance-rated doors, except where vertical rod exit devices are specified for both leaves swinging in the same direction.
  4. Construct fireresistance-rated doors in stairwell enclosures for maximum transmitted temperature rise of 230 °C (450 °F) above ambient

temperature at end of 30 minutes of fire exposure when tested in accordance with ASTM E152.

F. Custom Metal Hollow Doors:

1. Provide custom hollow metal doors where nonstandard steel doors are indicated. At the Contractor's option, custom hollow metal doors may be provided in lieu of standard steel doors. Door size(s), design, materials, construction, gages, and finish shall be as specified for of standard steel doors.

## 2.3 METAL FRAMES

A. General:

1. ANSI A250.8, 1.3 mm (0.053 inch) thick sheet steel, types and styles as shown or scheduled.
2. Frames for labeled fireresistance-rated doors.
  - a. Comply with NFPA 80. Test by Underwriters Laboratories, Inc., Inchcape Testing Services, or Factory Mutual.
  - b. Fireresistance-rated labels of approving laboratory permanently attached to frames as evidence of conformance with these requirements. Provide labels of metal or engraved stamp, with raised or incised markings.
3. Knocked-down frames are not acceptable.

B. Reinforcement and Covers:

1. ANSI A250.8 for, minimum thickness of steel reinforcement welded to back of frames.
2. Provide mortar guards securely fastened to back of hardware reinforcements.

C. Terminated Stops: ANSI A250.8.

D. Glazed Openings:

- a. Integral stop on corridor or secure side of door.
- b. Design rabbet width and depth to receive glazing material shown or specified.

E. Frame Anchors:

1. Floor anchors:
  - a. Where floor fills occur, provide extension type floor anchors to compensate for depth of fill.
  - b. At bottom of jamb use 1.3 mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive two 6 mm (1/4 inch) floor bolts.

- c. Where mullions occur, provide 2.3 mm (0.093 inch) thick steel channel anchors, drilled for two 6 mm (1/4 inch) floor bolts and frame anchor screws.
  - d. Where sill sections occur, provide continuous 1 mm (0.042 inch) thick steel rough bucks drilled for 6 mm (1/4 inch) floor bolts and frame anchor screws. Space floor bolts at 50 mm (24 inches) on center.
2. Jamb anchors:
- a. Locate anchors on jambs near top and bottom of each frame, and at intermediate points not over 600 mm (24 inches) apart, except for fireresistance-rated frames space anchors as required by labeling authority.
  - b. Form jamb anchors of not less than 1 mm (0.042 inch) thick steel unless otherwise specified.
  - c. Anchors for stud partitions: Either weld to frame or use lock-in snap-in type. Provide tabs for securing anchor to the sides of the studs.
  - d. Anchors for frames set in prepared (or existing) openings:
    - 1) Steel pipe spacers with 6 mm (1/4 inch) inside diameter welded to plate reinforcing at jamb stops or hat shaped formed strap spacers, 50 mm (2 inches) wide, welded to jamb near stop.
    - 2) Drill jamb stop and strap spacers for 6 mm (1/4 inch) flat head bolts to pass thru frame and spacers.
  - e. Modify frame anchors to fit special frame and wall construction and provide special anchors where shown or required.

#### **2.4 TRANSOM PANELS (NOT USED)**

#### **2.5 LOUVERS (NOT USED)**

#### **2.6 SHOP PAINTING**

- A. ANSI A250.8.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Plumb, align and brace frames securely until permanent anchors are set.
  - 1. Use triangular bracing near each corner on both sides of frames with temporary wood spreaders at midpoint.
  - 2. Use wood spreaders at bottom of frame if the shipping spreader is removed.
  - 3. Protect frame from accidental abuse.

4. Where construction will permit concealment, leave the shipping spreaders in place after installation, otherwise remove the spreaders after the frames are set and anchored.
5. Remove wood spreaders and braces only after the walls are built and jamb anchors are secured.

B. Floor Anchors:

1. Anchor the bottom of door frames to floor with two 6 mm (1/4 inch) diameter expansion bolts.
2. Power-actuated drive pins may be used to secure frame anchors to concrete floors.

C. Jamb Anchors:

1. Secure anchors to sides of studs with two fasteners through anchor tabs. Use steel drill screws to steel studs.

- D. Install anchors for labeled fireresistance-rated doors to provide rating as required.

**3.2 INSTALLATION OF DOORS AND APPLICATION OF HARDWARE**

- A. Install doors and hardware as specified in Section 08 14 00, INTERIOR WOOD DOORS and Section 08 71 00, DOOR HARDWARE.

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**SECTION 08 14 00**  
**INTERIOR WOOD DOORS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies interior flush doors, prefinished and prefit.
- B. Section includes fireresistance-rated doors, sound-retardant-rated doors, and smoke doors.

**1.2 RELATED WORK**

- A. Metal door frames: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.
- B. Door hardware including hardware location (height): Section 08 71 00, DOOR HARDWARE.
- C. Installation of door frames and hardware: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES or Section 08 71 00, DOOR HARDWARE.
- D. Glazing: Section 08 80 00, GLAZING.
- E. Card readers and biometric devices: Section 28 13 00, ACCESS CONTROL

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
  - 1. Corner section of flush veneered door 300 mm (12 inches) square, showing details of construction, labeled to show grade and type number and conformance to specified standard.
  - 2. Veneer sample 200 mm (8 inch) by 275 mm (11 inch) by 6 mm (1/4 inch) showing specified wood species sanded to receive a transparent finish. Factory-finish veneer sample.
- C. Shop Drawings:
  - 1. Show every door in project and schedule location in building.
  - 2. Indicate type, grade, finish and size; include detail of glazing, sound gasketing, and pertinent details.
  - 3. Provide information concerning specific requirements not included in the manufacturer's literature and data submittal.
- D. Manufacturer's Literature and Data:
  - 1. Sound rated doors, including test report indicating STC rating per ASTM E90 from test laboratory.
  - 2. Labeled fireresistance-rated doors showing conformance with NFPA 80.
- E. Laboratory Test Reports:
  - 1. Screw holding capacity test report in accordance with WDMA T.M.10.
  - 2. Split resistance test report in accordance with WDMA T.M.5.

3. Cycle/Slam test report in accordance with WDMA T.M.7.
4. Hinge-Loading test report in accordance with WDMA T.M.8.

#### 1.4 WARRANTY

- A. Doors are subject to terms of Article titled "Warranty of Construction", FAR clause 52.246-21, except that warranty shall be as follows:
  1. Manufacturer's warranty for lifetime of original installation.
  2. Specified STC RATING for sound-retardant-rated door assembly in place.

#### 1.5 DELIVERY AND STORAGE

- A. Factory-seal doors and accessories in minimum of 6-mil polyethylene bags or cardboard packages which shall remain unbroken during delivery and storage.
- B. Store in accordance with WDMA I.S.1-A, Job Site Information.
- C. Label package for door opening where used.

#### 1.6 APPLICABLE PUBLICATIONS

Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.

- B. Window and Door Manufacturers Association (WDMA):
  - I.S.1A-13.....Architectural Wood Flush Doors
  - T.M.6-14.....Adhesive (Glue Bond) Durability Test Method
  - T.M.7-14.....Cycle-Slam Test Method
  - T.M.8-14.....Hinge Loading Test Method
  - T.M.10-14.....Screwholding Test Method
- C. National Fire Protection Association (NFPA):
  - 80-13.....Fire Doors and Other Opening Protectives
  - 252-12.....Fire Tests of Door Assemblies
- D. ASTM International (ASTM):
  - E90-09.....Laboratory Measurements of Airborne Sound Transmission Loss
  - E2074-00.....Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies

## PART 2 - PRODUCTS

### 2.1 FLUSH DOORS

- A. General:
  1. Meet requirements of WDMA I.S.1-A, Extra Heavy Duty.

2. Adhesive: Type II
  3. Thickness: 45 mm (1-3/4 inches) unless otherwise shown or specified.
- B. Face Veneer:
1. In accordance with WDMA I.S.1-A.
  2. One species throughout the project unless scheduled or otherwise shown.
  3. Premium Grade.
    - b. Match face veneers for doors for uniform effect of color and grain at joints.
    - c. Door edges shall be same species as door face veneer except maple may be used for stile face veneer on birch doors.
    - d. Use wood species and grade of face veneers to match adjacent existing doors.
  4. Factory-sand doors for finishing.
- C. Wood for stops and moldings of flush doors required to have transparent finish:
1. Solid Wood of same species as face veneer, except maple may be used on birch doors.
  2. Glazing:
    - a. On non-labeled doors use applied wood stops nailed tight on room side and attached on opposite side with flathead, countersunk wood screws, spaced approximately 125 mm (5 inches) on centers.
- D. Fireresistance-rated wood doors:
1. Fire Performance Rating:
    - a. "B" label, 1-1/2 hours.
    - b. "C" label, 3/4 hour.
  2. Labels:
    - a. Doors shall conform to the requirements of ASTM E2074, or NFPA 252, and, carry an identifying label from a qualified testing and inspection agency for class of door or opening shown designating fire performance rating.
    - b. Metal labels with raised or incised markings.
  3. Performance Criteria for Stiles of doors utilizing standard mortise leaf hinges:
    - a. Hinge Loading: WDMA T.M.8. Average of 10 test samples for Extra-Heavy-Duty doors.

- b. Direct Screw Withdrawal: WDMA T.M.10 for Extra-Heavy-Duty doors. Average of 10 test samples using a steel, fully threaded #12 wood screw.
  - c. Cycle Slam: 1,000,000 cycles with no loose hinge screws or other visible signs of failure when tested in accordance with WDMA T.M.7.
- 4. Additional Hardware Reinforcement:
  - a. Provide fireresistance-rated doors with hardware reinforcement blocking.
  - b. Size of lock blocks as required to secure hardware specified.
  - c. Top, bottom and intermediate rail blocks shall measure not less than 125 mm (five inches) minimum by full core width.
  - d. Reinforcement blocking in compliance with manufacturer's labeling requirements.
  - e. Mineral material similar to core is not acceptable.
- 5. Other Core Components: Manufacturer's standard as allowed by the labeling requirements.
- 6. Provide steel frame approved for use in labeled doors for vision panels.
- 7. Provide steel astragal on pair of doors.
- E. Smoke Barrier Doors:
  - 1. For glazed openings use steel frames approved for use in labeled doors.
  - 2. Provide a steel astragal on one leaf of pairs of doors, including double egress doors.
- F. Sound-Rated Doors:
  - 1. Fabricated as specified for flush wood doors with additional construction requirements to meet specified sound transmission class (STC).
  - 2. STC Rating of the door assembly in place when tested in accordance with ASTM E90 by an independent nationally recognized acoustical testing laboratory not less than 45.
  - 3. Accessories:
    - a. Frame Gaskets: Continuous closed cell sponge neoprene with stop adjusters.
    - b. Automatic Door Bottom Seal:



- 1) Steel spring operated, closed cell sponge neoprene metal mounted removable in extruded aluminum housing with a medium matte 0.1 mm (4.0 mil) thick clear Anodized finish.

- 2) Concealed or Surface Mounted.

## **2.2 STILE AND RAIL DOORS (NOT USED)**

## **2.3 PREFINISH, PREFIT**

- A. Flush doors shall be factory-machined to receive hardware, bevels, undercuts, cutouts, accessories and fitting for frame.
- B. Factory-fitting shall conform to specification for shop- and field-fitting, including factory-application of sealer to edge and routings.
- C. Flush doors to receive transparent finish (in addition to being prefit) shall be factory-finished as follows:
  1. WDMA I.S.1-A Section F-3 specification for System TR-4, Conversion Varnish or System TR-5, Catalyzed Vinyl.
  2. Use stain when required to produce the finish specified on Drawings.

## **2.4 IDENTIFICATION MARK:**

- A. On top edge of door.
- B. Either a stamp, brand, or other indelible mark, giving manufacturer's name, door's trade name, construction of door, code date of manufacture and quality.
- C. Accompanied by either of the following additional requirements:
  1. An identification mark or a separate certification including name of inspection organization.
  2. Identification of standards for door, including glue type.
  3. Identification of veneer and quality certification.

## **2.5 SEALING:**

- A. Give top and bottom edge of doors two coats of catalyzed polyurethane or water-resistant sealer before sealing in shipping containers.

## **PART 3 - EXECUTION**

### **3.1 DOOR PREPARATION**

- A. Field-, shop-, or factory-preparation: Do not violate the qualified testing and inspection agency label requirements for fireresistance-rated doors.
- B. Clearances between Doors and Frames and Floors:
  1. Maximum 3 mm (1/8 inch) clearance at the jambs, heads, and meeting stiles, and a 19 mm (3/4 inch) clearance at bottom, except as otherwise specified.

2. Maximum clearance at bottom of sound-retardant-rated doors and doors designated to be fitted with mechanical seal: 10 mm (3/8 inch).
- C. Provide cutouts for special details required and specified.
  - D. Rout doors for hardware using templates and location heights specified in Section, 08 71 00 DOOR HARDWARE.
  - E. Fit doors to frame, bevel lock edge of doors 3 mm (1/8 inch) for each 50 mm (two inches) of door thickness; undercut where shown.
  - F. Immediately after fitting and cutting of doors for hardware, seal cut edges of doors with two coats of water resistant sealer.
  - G. Finish surfaces, including both faces, top and bottom and edges of the doors smooth to touch.
  - H. Apply a steel astragal on the opposite side of active door on pairs of fireresistance-rated doors.
  - I. Apply a steel astragal to meeting style of active leaf of pair of doors or double egress smoke doors.

### **3.2 INSTALLATION OF DOORS APPLICATION OF HARDWARE**

- A. Install doors and hardware as specified in this Section.

### **3.3 DOOR PROTECTION**

- A. As door installation is completed, place polyethylene bag or cardboard shipping container over door and tape in place.
- B. Provide protective covering over knobs and handles in addition to covering door.
- C. Maintain covering in good condition until removal is approved by COR.

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**SECTION 08 31 13  
ACCESS DOORS AND FRAMES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. Section specifies access doors or panels.

**1.2 RELATED WORK:**

- A. Lock Cylinders: Section 08 71 00, DOOR HARDWARE.
- B. Access doors in acoustical ceilings: Section 09 51 00, ACOUSTICAL CEILINGS.
- C. Locations of access doors for duct work cleanouts: Section 23 31 00, HVAC DUCTS AND CASINGS // Section 23 37 00, AIR OUTLETS AND INLETS .

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Access doors, each type, showing construction, location and installation details.
- C. Manufacturer's Literature and Data: Access doors, each type.

**1.4 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Society for Testing and Materials (ASTM):  
  - A167-99(R-2009).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip
  - A1008-10.....Steel Sheet, Cold-Rolled, Carbon, Structural, High Strength Low-Alloy
- C. American Welding Society (AWS):  
  - D1.3/D1.3M-08.....Structural Welding Code Sheet Steel
- D. National Fire Protection Association (NFPA):  
  - 80-10.....Fire Doors and Windows
- E. The National Association of Architectural Metal Manufacturers (NAAMM):  
  - AMP 500 Series.....Metal Finishes Manual
- F. Underwriters Laboratories, Inc. (UL):  
  - Fire Resistance Directory

**PART 2 - PRODUCTS****2.1 FABRICATION, GENERAL**

- A. Fabricate components to be straight, square, flat, and in same plane where required.
  - 1. Slightly round exposed edges and without burrs, snags, and sharp edges.
  - 2. Exposed welds continuous and ground smooth.
  - 3. Weld in accordance with AWS D1.3/D1.3M.
- B. Number of locks and non-continuous hinges as required to maintain alignment of panel with frame.
- C. Provide anchors or make provisions in frame for anchoring to adjacent construction. Provide size, number and location of anchors on four sides to secure access door in opening.

**2.2 ACCESS DOORS, FIRE RATED (NOT USED)****2.3 ACCESS DOORS, FLUSH PANEL:**

- A. Door Panel:
  - 1. Form of 1.9 mm (0.0747 inch) thick steel sheet.
  - 2. Reinforce to maintain flat surface.
- B. Frame:
  - 1. Form of 1.5 mm (0.0598 inch) thick steel sheet of depth and configuration to suit material and type of construction where installed.
  - 2. Provide surface-mounted units having frame flange at perimeter where installed in concrete, masonry, or gypsum board construction.
  - 3. Weld exposed joints in flange and grind smooth.
- C. Hinge:
  - 1. Concealed spring hinge to allow panel to open 175 degrees.
  - 2. Provide removable hinge pin to allow removal of panel from frame.
- D. Lock:
  - 1. Flush, screwdriver operated cam lock.

**2.4 ACCESS DOOR, RECESSED PANEL (NOT USED)****2.5 FINISH:**

- A. Provide in accordance with NAAMM AMP 500 series on exposed surfaces.
- B. Steel Surfaces: Baked-on prime coat over a protective phosphate coating.

**2.6 SIZE:**

- A. Minimum 600 mm (24 inches) square door unless otherwise shown.

**PART 3 - EXECUTION****3.1 LOCATION:**

- A. Provide access panels or doors wherever any valves, traps, dampers, cleanouts, and other control items of mechanical and electrical work are concealed in wall or partition, or are above ceiling of gypsum board or plaster.
- B. Use flush panels in partitions and gypsum board or plaster ceilings

**3.2 INSTALLATION, GENERAL:**

- A. Install access doors in openings to have sides vertical in wall installations, and parallel to side walls when installed in ceiling.
- B. Set frames with flanges to overlap opening and so that face will be uniformly spaced from the finish surface.

**3.3 ANCHORAGE:**

- A. Secure frames to adjacent construction using anchors attached to frames or by use of bolts or screws through the frame members.
- B. Type, size and number of anchoring device suitable for the material surrounding the opening, maintain alignment, and resist displacement during normal use of access door.

**3.4 ADJUSTMENT:**

- A. Adjust hardware so that door panel will open freely.
- B. Adjust door when closed so door panel is centered in the frame.

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SECTION 08 56 19  
PASS WINDOWS

PART 1 - GENERAL

### 1.1 DESCRIPTION

A. This Section specifies sliding-glass counter-mounted pass windows.

## 1.2 RELATED WORK

A. Glass and Glazing: Section 08 80 00, GLAZING.

### 1.3 APPLICABLE PUBLICATIONS

A. Publications listed below form a part of this specification to extend referenced. Publications are referenced in text by basic designation only.

B. American Society for Testing and Materials (ASTM):

B221/221M-08.....Aluminum and Aluminum- Alloy Extruded Bars,  
Rods, Wire, Shapes and Tubes (Metric)

C509-06.....Elastomeric Cellular Preformed Gasket and  
Sealing Material

C. American Society of Mechanical Engineers (ASME):

B18.6.4-98(R2005).....Thread Forming and Thread Cutting Tapping  
Screws and Metallic Drive Screws

#### D. Master Painters Institute (MPI):

MPI #18.....Organic Zinc Rich Coating

E. National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500 Series.....Metal Finishes Manual

AMP 500.....Introduction to Metal Finishing

AMP 501.....Finishes for Aluminum

## 1.4 SUBMITTALS

A. See Division 01 ("General Requirements") for submittal procedures and general requirements.

B. Product Data: Submit manufacturer's product data for specified products indicating materials, operation, glazing, finishes, and installation instructions.

C. Shop Drawings: Indicate configuration, sizes, rough-in, mounting, anchors and fasteners, and installation clearances.

PART 2 - PRODUCTS

## 2.1 MATERIAL

### A. Aluminum Extrusions:

1. ASTM B221M.

2. Alloy and temper recommended by window manufacturer for strength, corrosion resistance, and application of required finish, but not less than 150 MPa (22,000 psi) ultimate tensile strength, and yield of 110 MPa (16,000 psi).
  3. Aluminum alloy used for colored anodic coating as required to produce specified color.
- B. Paint: MPI #18.
- C. Glazing Gaskets: ASTM C509.

## **2.1 SLIDING GLASS PASS WINDOWS, COUNTER MOUNTED**

- A. Fabricate sliding glass sash and frames of extruded aluminum with corners mitered.
1. Configuration: Double horizontal-sliding, bypassing.
  2. Operation: Manual.
  3. Mounting: Mounted to the head jambs of the wall opening and fully contained within the depth of the wall.
  4. Counter Space Size: Requiring only a short stationary guide (or spring-loaded retractable guides) at the bottom center of the opening. Full-length guides or tracks along the bottom of either half of the opening will not be acceptable.
- B. Fabricate sash to receive 6 mm (1/4 inch) thick glass.
- C. Fabricate top-hung sliding sash .
- D. Provide sash with pin tumbler lock and two keys.
- E. Provide sash with finger slot on vertical edge.
- F. Fabricate frame with channel sash slot and top guides.
1. Rigidly fit and secure joints and corners with internal reinforcement. Make joints and connections flush and hairline. Fully weld corners.
- G. Sash may be factory- or field-glazed using glazing gaskets.
- H. Use concealed screws in assembly.
- I. Finish:
1. Comply with NAAMM AMP 500 Series.
  2. Clear anodic coating, Class II Architectural 0.4 mills thick, AA-C22A41.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install in pass window opening level and plumb.
- B. Secure with screws to opening; ASME B18.6.4.
1. Screw within 100 mm (4 inches) of ends.



- 2. Space screws not over 600 mm (24 inches) between end screws.
- C. Coat aluminum in contact with steel with one coat of MPI No. 18.
- D. Clean unit of dust and markings.

### 3.2 OPERATION

- A. Adjust to roll smoothly and stay in position where stopped.
- B. Demonstrate operation and locking to COR.
- C. Turn keys with key tags over to COR.

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**SECTION 08 56 88**  
**INTERIOR INSULATING WINDOWS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Interior insulating windows for enhanced impact-resistance of existing windows.
- B. Labor, materials, tools, equipment, and services needed to furnish and install interior insulating windows.
- C. Components furnished with installed interior windows.
- D. Furnishing and use of installation accessories (shims, anchors, attachment devices, and the like).

**1.02 RELATED REQUIREMENTS**

- A. Section 08 80 00 - Glazing: Description of glazing.

**1.03 DEFINITIONS**

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.
- C. Mock-Up: Full-size, physical example assembly to illustrate finishes and materials. Mock-Up will be used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not samples. Mock-Ups establish the standard by which the Work will be judged.
- D. Ultimate Resistance: The capacity of the element; otherwise defined as the uniform pressure load that causes the element to yield.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene at least two weeks prior to starting the work of this Section per Division 01 - General Requirements.
- B. Sequencing:
  - 1. Coordinate work with that of other entities affecting or affected by work of this Section. Cooperate with such entities to assure the steady progress of the Work.
  - 2. Ensure that products of this Section are supplied to affected trades in time to prevent interruption of construction progress.

**1.05 REFERENCE STANDARDS**

- A. American Architectural Manufacturers Association (AAMA):
  - 1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
  - 2. AAMA 800 - Voluntary Specifications and Test Methods for Sealants.
  - 3. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
  - 4. AAMA IPCB - AAMA Standard Practice for the Installation of Windows and Doors in Commercial Buildings.

- B. ASTM International:
  - 1. ASTM C1184 - Standard Specification for Structural Silicone Sealants.
  - 2. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
- C. Glass Association of North America (GANA):
  - 1. GANA GM - Glazing Manual.
  - 2. GANA Glass Informational Bulletins (GIBs):
    - a. GANA 01-0300 - Proper Procedures for Cleaning Architectural Glass Products.
  - 3. GANA Tempering Division Glass Information Bulletins (GIBs):
    - a. GANA TD-02-0402 - Heat Treated Glass Surfaces are Different.

#### **1.06 SUBMITTALS**

- A. General: Provide all submittals in a timely manner to meet the required construction completion schedule. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Shop Drawings: Submit for each design required for the Project. Shop Drawings shall be prepared wholly by the window manufacturer, or a qualified engineering services firm under the direction of the manufacturer and signed and sealed by a Registered Professional Engineer, licensed in Project jurisdiction. Shop Drawings for pre-engineered configurations may be prepared by authorized installers.
  - 1. Shop Drawings shall show coordination of the windows and their supporting structure with existing and new construction.
  - 2. Provide design details at half-size (6 inches equal one foot) along with Product Data to define system aesthetic and functional characteristics.
- C. Samples for Verification:
  - 1. Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.
- D. Delegated Design Submittals:
  - 1. Submit design analysis calculations signed and sealed by a Registered Professional Engineer licensed in Project jurisdiction to verify conformance to specified criteria. The submission of calculations is required for each design submittal for the Project.
  - 2. Submit a design narrative with a clear table of contents listing all assumptions and clearly cross referenced and fully coordinated with the design calculations and Shop Drawings for each submission. The submission of narratives is required for each design submittal for the Project.
- E. Qualification Data: Submit qualifications verifying years of experience: include list of completed projects having similar scope of work identified by name, location, reference names, and phone numbers.

#### **1.07 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. Manufacturer:
    - a. Minimum of five years of experience manufacturing similar products.
  - 2. Installer:
    - a. Minimum two years of experience installing similar products.

- b. Installer: Provide written confirmation that the installer is authorized by the window manufacturer to install window products to be used on this Project.
- B. Mock-Up: First installation shall serve as a Mock-Up for evaluation of surface preparation techniques and installation workmanship.
  - 1. Installation area shall be designated by Architect.
  - 2. Do not proceed with remaining work until workmanship is approved by Architect.
  - 3. Refinish Mock-Up area as required to produce acceptable work.
  - 4. Accepted Mock-Up shall serve as the standard of workmanship for the remainder of the interior insulating windows.

#### **1.08 DELIVERY, STORAGE AND HANDLING**

- A. Materials shall be packed, loaded, shipped, unloaded, stored, and protected in accordance with AAMA CW-10.
- B. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- D. Exercise care to prevent damage to glass and damage/deterioration to coating on glass.
- E. Handling: Handle materials to avoid damage

#### **1.09 WARRANTY**

- A. Products: Submit a written warranty, executed by the window manufacturer, for a period of five years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
  - 1. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
  - 2. Warranty for all components must be direct from the manufacturer (non-pass-through) and non-pro-rated for the entire term.
- B. Installation: Submit a written warranty, executed by the window installer, for a period of five years from the date of Substantial Completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
  - 1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Acceptable Manufacturer (Basis-of-Design): Therm-O-Lite, Inc.; Series 2000AL: [www.thermolitewindows.com](http://www.thermolitewindows.com). Subject to compliance with the requirements of this Section, provide the product named above - or the following comparable product.
  - 1. Wausau Window and Wall Systems; Series 1297 S.E.A.L.: [www.wausau.com](http://www.wausau.com).

**2.02 SYSTEM DESCRIPTION**

- A. Interior Fixed Aluminum Window System:
  - 1. Design, fabricate, and install interior frames, glazing, attachments, and anchorage to the interior of indicated existing-to-remain windows.
    - a. The window frames, anchorage, and supporting walls shall not fail prior to the glazing under lateral load.
    - b. Analysis of the glazing shall be performed with a minimum bite of 10.16mm glass engagement into the window sash.
  - 2. The frame and mullions of the fixed aluminum window system shall be aligned with the frame and mullions of the existing exterior window such that the appearance of the existing assembly is maintained including window mullion configurations.
  - 3. Fixed aluminum window systems shall be removable to facilitate access to the space between the interior and exterior windows for regular maintenance and cleaning.
  - 4. The window sash shall be sealed with integral slotted magnetic extrusions on jambs.

**2.03 PERFORMANCE REQUIREMENTS**

- A. General: Conform to specified AAMA standards wherever they are more stringent than what is specified herein.
  - 1. The window frames, anchorage, and supporting walls shall not fail prior to the glazing under lateral load.
  - 2. Analysis of the glazing shall be performed with a minimum bite of 10.16mm glass engagement into the window sash.
- B. Air Infiltration/Exfiltration: When tested in accordance with cited test procedures, and with all purposeful vent holes plugged, windows shall meet or exceed the following performance criteria:
  - 1. Air Infiltration and Exfiltration: Maximum 0.3 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.

**2.04 MATERIALS**

- A. Aluminum Framing Members: Provide material of proper alloy and temper to meet specified requirements and compatibility with specified finishes.

**2.05 COMPONENTS**

- A. Hardware: Material shall be corrosion-resistant and compatible with aluminum.
- B. Fasteners: Tamper-resistant aluminum, stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum window members, trim, anchors, and other components of window units.
- C. Sealants: Comply with applicable provisions of AAMA 800.
  - 1. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.
- D. Glazing: Provide in general accordance with Section 08 80 00 - Glazing.
  - 1. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.

**E. Glazing Materials:**

1. Setting Blocks / Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-emissivity glass shall be silicone.
2. Back-Bedding Tapes, Expanded Cellular Glazing Tapes, Toe Beads, Heel Beads and Cap Beads: Meeting the requirements of applicable specifications cited in AAMA 800.
3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
4. Structural Silicone Sealant (Where Used): Meeting the requirements of ASTM C1184.
  - a. Spacer Tape in Continuous Contact with Structural Silicone: Tested for compatibility and approved by the sealant manufacturer for the intended application.
  - b. Gaskets in Continuous Contact with Structural Silicone: Extruded silicone or compatible material.

**F. Glazed Sash:** Provide lift-off sash with tamper-resistant machine screws for custodial operation.

**G. Weatherstripping:** Bulb- or fin-type neoprene, ethylene propylene diene monomer (EPDM), dual-durometer polyvinyl-chloride (PVC), polypropylene, thermoplastic elastomer (TPE), or other suitable material as approved by the window manufacturer.

**2.06 FABRICATION**

- A. General: Finish, fabricate, and shop-assemble frame and sash members into complete windows under the responsibility of one manufacturer.
- B. Frames: Miter all corners and mechanically stake over a solid extruded aluminum corner block, set and sealed in epoxy; or miter and weld each corner.
- C. Interior Operable Sash: Miter all corners and mechanically stake over a solid extruded-aluminum corner block, set and sealed in epoxy, leaving hairline joinery.
- D. Miter, crowd, stake, or join weatherstripping at corners.

**2.07 FINISHES**

- A. Finish of Aluminum Components: Finish of all exposed areas of aluminum windows and components shall be done in accord with the appropriate AAMA Voluntary Guide Specification shown:

Designation	Description	Standard	Color
AAM10C21A41	Clear Class I Eco-Friendly Etch	AAMA 611	Clear

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. Site Verification of Conditions:
  1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved Shop Drawings, and Contract Documents.
  2. Do not install windows until unsatisfactory conditions are corrected and substrates have been properly prepared.

**3.02 PREPARATION**

- A. Prepare openings to be in tolerance, plumb, and level - and provide for secure anchoring.
- B. Verify that openings are in accordance with approved Sop Drawings.

**3.03 INSTALLATION**

- A. Install interior insulating windows with skilled workers in accordance with:
  - 1. Approved Shop Drawings.
  - 2. Manufacturer's installation instructions, specifications, and recommendations.
  - 3. The AAMA IPCB.
- B. Install windows plumb, square, and level for proper operation without warp or rack of frames.
- C. Isolate aluminum from direct contact with steel, masonry, concrete, or other dissimilar metals by bituminous paint, rust-inhibiting insulating, non-conductive shims or other suitable insulating material, if exposure to moisture will occur at any point during construction or occupancy.

**3.04 ADJUSTING**

- A. Adjust windows before cleaning.

**3.05 CLEANING**

- A. Clean interior insulating windows in accordance with:
  - 1. GANA 01-0300.
  - 2. GANA TD-02-0402.
- B. Leave windows clean and free of construction debris.

**3.06 PROTECTION**

- A. Protect installed products until date of completion of Project.
- B. Touch-up, repair, or replace damaged products before Substantial Completion.

**END OF SECTION**



**SECTION 08 71 00**  
**DOOR HARDWARE**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. Door hardware and related items necessary for complete installation and operation of doors.

**1.2 RELATED WORK**

- A. Hardware on Sliding Panels: Section 06 82 13, RESIN SHEET FABRICATIONS.
- B. Caulking: Section 07 92 00 JOINT SEALANTS.
- C. Section 08 06 10, DOOR OPENING SCHEDULE.
- D. Section 08 06 71, DOOR HARDWARE SCHEDULE.
- E. Application of Hardware: Section 08 14 00, INTERIOR WOOD DOORS, and Section 08 11 13, HOLLOW METAL DOORS AND FRAMES,.
- F. Painting: Section 09 91 00, PAINTING.
- G. Card Readers: Section 28 13 00, PHYSICAL ACCESS CONTROL SYSTEMS.
- H. Electrical: Division 26, ELECTRICAL.
- I. Fire Detection: Section 28 31 00, FIRE DETECTION AND ALARM.

**1.3 GENERAL**

- A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.
- B. Provide fire-rated door hardware assemblies where required by most current version of the International Building Code (IBC).
- C. Hardware for Labeled Fire Doors and Exit Doors: Conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Provide hardware listed by UL, except where heavier materials, large size, or better grades are specified herein under paragraph HARDWARE SETS. In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements.
- D. Hardware for application on metal and wood doors and frames shall be made to standard templates. Furnish templates to the fabricator of these items in sufficient time so as not to delay the construction.
- E. The following items shall be of the same manufacturer, except as otherwise specified:
  - 1. Mortise locksets.
  - 2. Hinges for hollow metal and wood doors.
  - 3. Surface-applied overhead door closers.

4. Exit devices.

#### 1.4 WARRANTY

A. Door hardware shall be subject to the terms of FAR Clause 52.246-21, except that the Warranty period shall be two years in lieu of one year for all items except as noted below:

1. Locks, Latchsets, and Exit Hardware: 5 years.
2. Door Closers and Continuous Hinges: 10 years.

#### 1.5 MAINTENANCE MANUALS

A. In accordance with Section 01 00 00, GENERAL REQUIREMENTS Article entitled "INSTRUCTIONS", furnish maintenance manuals and instructions on all door hardware. Provide installation instructions with the submittal documentation.

#### 1.6 SUBMITTALS

A. Submittals shall be in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Submit six copies of the schedule per Section 01 33 23. Submit two final copies of the final approved schedules to VAMC Locksmith as record copies (VISN Locksmith if the VAMC does not have a locksmith).

B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire-rated and listed)	ANSI/BHMA Finish Designation

C. Samples and Manufacturers' Literature:

1. Samples: All hardware items (proposed for the Project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified.

- D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

#### **1.7 DELIVERY AND MARKING**

- A. Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to COR for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These items shall remain on file in COR's office until all other similar items have been installed in Project, at which time the COR will deliver items on file to Contractor for installation in predetermined locations on the Project.

#### **1.8 PREINSTALLATION MEETING**

- A. Convene a preinstallation meeting not less than 30 days before start of installation of door hardware. Require attendance of parties directly affecting work of this Section, including Contractor and Installer, Architect, Project Engineer and VA Locksmith, Hardware Consultant, and Hardware Manufacturer's Representative. Review the following:
1. Inspection of door hardware.
  2. Job and surface readiness.
  3. Coordination with other work.
  4. Protection of hardware surfaces.
  5. Substrate surface protection.
  6. Installation.
  7. Adjusting.
  8. Repair.
  9. Field quality control.
  10. Cleaning.

#### **1.9 INSTRUCTIONS**

- A. Hardware Set Symbols on Drawings: Except for protective plates, door stops, mutes, thresholds, and the like specified herein, hardware requirements for each door are indicated on drawings by symbols. Symbols for hardware sets consist of letters (e.g., "HW") followed by a

number. Each number designates a set of hardware items applicable to a door type.

- B. Keying: All cylinders shall be keyed into existing Best Great Grand Master Key System. Provide removable core cylinders that are removable only with a special key or tool without disassembly of knob or lockset. Keying information shall be furnished at a later date by the COR.

#### 1.10 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only. In text, hardware items are referred to by series, types, etc., listed in such specifications and standards, except as otherwise specified.
- B. American Society for Testing and Materials (ASTM):
- E2180-07.....Standard Test Method for Determining the  
Activity of Incorporated Antimicrobial Agent(s)  
In Polymeric or Hydrophobic Materials
- C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
- A115-##.....Steel Door and Frame Preparation for Hardware
- A156.1-06.....Butts and Hinges
- A156.3-08.....Exit Devices, Coordinators, and Auto Flush  
Bolts
- A156.4-08.....Door Controls (Closers)
- A156.5-14.....Cylinders and Input Devices for Locks.
- A156.6-05.....Architectural Door Trim
- A156.8-05.....Door Controls-Overhead Stops and Holders
- A156.13-05.....Mortise Locks and Latches Series 1000
- A156.15-06.....Release Devices-Closer Holder, Electromagnetic  
and Electromechanical
- A156.16-08.....Auxiliary Hardware
- A156.18-06.....Materials and Finishes
- A156.21-09.....Thresholds
- A156.22-05.....Door Gasketing and Edge Seal Systems
- A156.24-03.....Delayed Egress Locking Systems
- A156.26-06.....Continuous Hinges
- A156.28-07 .....Master Keying Systems
- A156.31-07 .....Electric Strikes and Frame Mounted Actuators
- D. National Fire Protection Association (NFPA):

80-10.....Fire Doors and Other Opening Protectives

101-09.....Life Safety Code

E. Underwriters Laboratories, Inc. (UL):

Building Materials Directory (2008)

## **PART 2 - PRODUCTS**

### **2.1 BUTT HINGES**

- A. ANSI A156.1. Provide only three-knuckle hinges, except five-knuckle where the required hinge type is not available in a three-knuckle version (e.g., some types of swing-clear hinges). The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:
1. Exterior Doors: Type A2112/A5112 for doors 900 mm (3 feet) wide or less and Type A2111/A5111 for doors over 900 mm (3 feet) wide. Hinges for exterior outswing doors shall have non-removable pins. Hinges for exterior fire-rated doors shall be of stainless steel material.
  2. Interior Doors: Type A8112/A5112 for doors 900 mm (3 feet) wide or less and Type A8111/A5111 for doors over 900 mm (3 feet) wide. Hinges for doors exposed to high-humidity areas (shower rooms, toilet rooms, kitchens, janitor rooms, and the like) shall be of stainless-steel material.
- B. Provide quantity and size of hinges per door leaf as follows:
1. Doors up to 1210 mm (4 feet) high: 2 hinges.
  2. Doors 1210 mm (4 feet) to 2260 mm (7 feet 5 inches) high: 3 hinges minimum.
  3. Doors greater than 2260 mm (7 feet 5 inches) high: 4 hinges.
  4. Doors up to 900 mm (3 feet) wide, standard weight: 114 mm x 114 mm (4-1/2 inches x 4-1/2 inches) hinges.
  5. Doors over 900 mm (3 feet) to 1065 mm (3 feet 6 inches) wide, standard weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
  6. Doors over 1065 mm (3 feet 6 inches) to 1210 mm (4 feet), heavy weight: 127 mm x 114 mm (5 inches x 4-1/2 inches).
  7. Provide heavy-weight hinges where specified.
  8. At doors weighing 330 kg (150 lbs.) or more, furnish 127 mm (5 inch) high hinges.
- C. See Articles "MISCELLANEOUS HARDWARE" and "HARDWARE SETS" for hinges other than butts specified above and continuous hinges specified below.

## 2.2 CONTINUOUS HINGES

- A. ANSI/BHMA A156.26, Grade 1-600.
  - 1. Listed under Category N in BHMA's "Certified Product Directory."
- B. General: Minimum 0.120-inch- (3.0-mm-) thick, hinge leaves with minimum overall width of 4 inches (102 mm); fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete
- C. Continuous, Barrel-Type Hinges: Hinge with knuckles formed around a Teflon-coated 6.35mm (0.25-inch) minimum diameter pin that extends entire length of hinge.
  - 1. Base Metal for Exterior Hinges: Stainless steel.
  - 2. Base Metal for Interior Hinges: Stainless steel.
  - 3. Base Metal for Hinges for Fire-Rated Assemblies: Stainless steel.
  - 4. Provide with non-removable pin (hospital tip option) at lockable outswing doors.
  - 5. Where required to clear adjacent casing, trim, and wall conditions and allow full door swing, provide wide throw hinges of minimum width required.
  - 6. Provide with manufacturer's cut-outs for separate mortised power transfers and/or mortised automatic door bottoms where they occur.
  - 7. Where thru-wire power transfers are integral to the hinge, provide hinge with easily removable portion to allow easy access to wiring connections.
  - 8. Where models are specified that provide an integral wrap-around edge guard for the hinge edge of the door, provide manufacturer's adjustable threaded stud and machine screw mechanism to allow the door to be adjusted within the wrap-around edge guard.

## 2.3 DOOR CLOSING DEVICES

- A. Closing devices shall be products of one manufacturer for each type specified.

## 2.4 OVERHEAD CLOSERS

- A. Conform to ANSI A156.4, Grade 1.
- B. Closers shall conform to the following:
  - 1. The closer shall have minimum 50-percent adjustable closing force over minimum value for that closer and have adjustable hydraulic back check effective between 60 degrees and 85 degrees of door opening.
  - 2. Where specified, closer shall have hold-open feature.

3. Size Requirements: Provide multi-size closers, sizes 1 through 6, except where multi-size closer is not available for the required application.
4. Material of closer body shall be forged or cast.
5. Arm and brackets for closers shall be steel, malleable iron or high-strength ductile cast iron.
6. Where closers are mounted in rooms that experience high humidity, provide closer body and arm assembly of stainless-steel material.
7. Closers shall have full-size metal cover; plastic covers will not be accepted.
8. Closers shall have adjustable hydraulic back-check, separate valves for closing and latching speed, adjustable back-check positioning valve, and adjustable delayed action valve.
9. Provide closers with any accessories required for the mounting application, including (but not limited to) drop plates, special soffit plates, spacers for heavy-duty parallel arm fifth screws, bull-nose or other regular arm brackets, longer or shorter arm assemblies, and special factory-templating. Provide special arms, drop plates, and templating as needed to allow mounting at doors with overhead stops and/or holders.
10. Closer arms or backcheck valve shall not be used to stop the door from overswing, except in applications where a separate wall, or overhead stop cannot be used.
11. Provide parallel-arm closers with heavy-duty rigid arm.
12. Where closers are to be installed on the push side of the door, provide parallel-arm type except where conditions require use of top-jamb arm.
13. Provide all surface closers with the same body attachment screw pattern for ease of replacement and maintenance.
14. All closers shall have a 1 ½" (38mm) minimum piston diameter.

## **2.5 FLOOR CLOSERS AND FLOOR PIVOT SETS (NOT USED)**

### **2.6 DOOR STOPS**

- A. Conform to ANSI A156.16.
- B. Provide door stops wherever an opened door or any item of hardware thereon would strike a wall, column, equipment or other parts of building construction. For masonry construction, use lead expansion shields for mounting door stops.

- C. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where two doors would interfere with each other in swinging.
- D. Provide appropriate door-mounted stop on doors in individual toilets where wall-mounted stops cannot be used.
- E. Provide door stops on doors where combination closer magnetic holders are specified, except where wall stops cannot be used.
- F. Where the specified wall stop cannot be used, provide concealed overhead stops (surface-mounted where concealed cannot be used).

## **2.7 OVERHEAD DOOR STOPS AND HOLDERS**

- A. Conform to ANSI Standard A156.8. Overhead holders shall be of sizes recommended by holder manufacturer for each width of door. Set overhead holders for 110-degree opening, unless limited by building construction or equipment. Provide Grade 1 overhead concealed slide type: stop-only at fire-rated doors and security doors, hold-open type with exposed hold-open on/off control at all other doors requiring overhead door stops.

## **2.8 FLOOR DOOR HOLDERS (NOT USED)**

## **2.9 LOCKS AND LATCHES**

- A. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Lock cylinders shall have not less than seven pins. Cylinders for all locksets shall be removable core type. Cylinder shall be removable by special key or tool. Construct all cores so that they will be interchangeable into the core housings of all mortise locks, rim locks, and any other type lock included in the Great Grand Master Key System. Disassembly of lever or lockset shall not be required to remove core from lockset. All locksets or latches on double doors with fire label shall have latch bolt with 19 mm (3/4 inch) throw, unless shorter throw allowed by the door manufacturer's fire label.
- B. In addition to above requirements, locks and latches shall comply with following requirements:
  - 1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets shall have lever handles fabricated from cast stainless steel. Provide sectional (lever x rose) lever design matching existing. No substitute lever material shall be accepted. All locks and latchsets shall be furnished with 122.55 mm (4-7/8-inch) curved



lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 21mm (7/8-inch) lip-to-center dimension. Lock function F02 shall be furnished with emergency tools/keys for emergency entrance. Furnish armored fronts for all mortise locks. Where mortise locks are installed in high-humidity locations or where exposed to the exterior on both sides of the opening, provide non-ferrous mortise lock case.

## **2.10 PUSH-BUTTON COMBINATION LOCKS (NOT USED)**

## **2.11 ELECTROMAGNETIC LOCKS**

- A. ANSI/BHMA A156.23; electrically powered, of strength and configuration indicated; with electromagnet attached to frame and armature plate attached to door. Listed under Category E in BHMA's "Certified Product Directory."
1. Type: Full interior.
  2. Strength Ranking: 1000 lbf (4448 N).
  3. Inductive Kickback Peak Voltage: Not more than 53 V.
  4. Residual Magnetism: Not more than 4 lbf (18 N) to separate door from magnet.
- B. Delayed-Egress Locks: BHMA A156.24. Listed under Category G in BHMA's "Certified Product Directory".
1. Means of Egress Doors: Lock releases within 15 seconds after applying a force not more than 15 lbf (67 N) for not more than 3 seconds, as required by NFPA 101.
  2. Security Grade: Activated from secure side of door by initiating device.
  3. Movement Grade: Activated by door movement as initiating device.
  4. The lock housing shall not project more than 4-inches (101mm) from the underside of the frame head stop.

## **2.12 ELECTRIC STRIKES**

- A. ANSI/ BHMA A156.31 Grade 1.
- B. General: Use fail-secure electric strikes at fire-rated doors.

## **2.13 KEYS**

- A. Stamp all keys with change number and key set symbol. Furnish keys in quantities as follows:

<b>Locks/Keys</b>	<b>Quantity</b>
Cylinder locks	2 keys each
Cylinder lock change key blanks	100 each different key way

Master-keyed sets	6 keys each
Grand Master sets	6 keys each
Great Grand Master set	5 keys
Control key	2 keys

#### **2.14 KEY CABINET (NOT USED)**

#### **2.15 KICK PLATES AND MOP PLATES**

- A. Conform to ANSI Standard A156.6.
- B. Provide protective plates as specified below:
  - 1. Kick plates and mop plates of metal, Type J100 series.
  - 2. Provide kick plates and mop plates where specified. Kick plates shall be 254 mm (10 inches) or 305 mm (12 inches) high. Mop plates shall be 152 mm (6 inches) high. Both kick and mop plates shall be minimum 1.27 mm (0.050 inches) thick. Provide kick and mop plates beveled on all 4 edges (B4E). On push side of doors where jamb stop extends to floor, make kick plates 38 mm (1-1/2 inches) less than width of door, except pairs of metal doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other kick and mop plates to within 6 mm (1/4 inch) of each edge of doors. Kick and mop plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
  - 3. Kick plates and/or mop plates are not required on following door sides:
    - a. Exterior side of exterior doors;
    - b. Closet side of closet doors;

#### **2.16 EXIT DEVICES**

- A. Conform to ANSI Standard A156.3. Exit devices shall be Grade 1; type and function are specified in hardware sets. Provide flush with finished floor strikes for vertical rod exit devices in interior of building. Trim shall have cast satin stainless steel lever handles of design similar to locksets, unless otherwise specified. Provide key cylinders for keyed operating trim and, where specified, cylinder dogging.
- B. Surface vertical rod panics shall only be provided less bottom rod; provide fire pins as required by exit device and door fire labels.
- C. At non-fire-rated openings with panic hardware, provide panic hardware with key cylinder dogging feature.

- D. Exit devices for fire doors shall comply with Underwriters Laboratories, Inc., requirements for Fire Exit Hardware. Submit proof of compliance.

#### **2.17 FLUSH BOLTS (LEVER EXTENSION)**

- A. Conform to ANSI A156.16. Flush bolts shall be Type L24081 unless otherwise specified. Furnish proper dustproof strikes conforming to ANSI A156.16, for flush bolts required on lower part of doors.
- B. Lever extension manual flush bolts shall only be used at non-fire-rated pairs for rooms only accessed by maintenance personnel.
- C. Face plates for cylindrical strikes shall be rectangular and not less than 25 mm by 63 mm (1 inch by 2-1/2 inches).
- D. Friction-fit cylindrical dustproof strikes with circular face plate may be used only where metal thresholds occur.
- E. Provide extension rods for top bolt where door height exceeds 2184 mm (7 feet 2 inches).

#### **2.18 FLUSH BOLTS (AUTOMATIC)**

- A. Conform to ANSI A156.3. Dimension of flush bolts shall conform to ANSI A115. Bolts shall conform to Underwriters Laboratories, Inc., requirements for fire door hardware. Flush bolts shall automatically latch and unlatch. Furnish dustproof strikes conforming to ANSI A156.16 for bottom flushbolt. Face plates for dustproof strike shall be rectangular and not less than 38 mm by 90 mm (1-1/2 by 3-1/2 inches).
- B. At interior doors, provide auto flush bolts less bottom bolt, unless otherwise specified, except at wood pairs with fire-rating greater than 20 minutes; provide fire pins as required by auto flush bolt and door fire labels.

#### **2.19 DOOR PULLS WITH PLATES (NOT USED)**

#### **2.20 PUSH PLATES (NOT USED)**

#### **2.21 COMBINATION PUSH AND PULL PLATES (NOT USED)**

#### **2.22 COORDINATORS**

- A. Conform to ANSI A156.16. Coordinators, when specified for fire doors, shall comply with Underwriters Laboratories, Inc., requirements for fire door hardware. Coordinator may be omitted on interior pairs of non-labeled open where open back strike is used. Open back strike shall not be used on labeled doors. Paint coordinators to match door frames. Provide bar type coordinators. For bar-type coordinators, provide filler bars for full width and, as required, brackets for push-side surface-mounted closers, overhead stops, and vertical-rod strikes.

**2.23 THRESHOLDS**

- A. Conform to ANSI A156.21, mill-finish extruded aluminum. Install in a bed of sealant with ¼-20 stainless steel machine screws and expansion shields. Furnish thresholds for the full width of the openings.
- B. At exterior doors, provide threshold with non-slip abrasive finish.

**2.24 AUTOMATIC DOOR BOTTOM SEAL AND RUBBER GASKET FOR LIGHT PROOF OR SOUND CONTROL DOORS (NOT USED)****2.25 WEATHERSTRIPS (FOR EXTERIOR DOORS)**

- A. Conform to ANSI A156.22. Air leakage shall not to exceed 0.50 CFM per foot of crack length (0.000774m<sup>3</sup>/s/m).

**2.26 MISCELLANEOUS HARDWARE**

- A. Access Doors (including Sheet Metal Types): Except for fire-rated doors and doors to Temperature Control Cabinets, equip each single- or double-metal access door with Lock Type E07213, conforming to ANSI A156.11. Key locks as directed. Ship lock prepaid to the door manufacturer. Hinges shall be provided by door manufacturer.
- B. Cylinders for Various Doors: Key cylinders same as entrance doors of area in which door occurs. Provide cylinders to operate locking devices where specified.
- C. Mutes: Conform to ANSI A156.16. Provide door mutes or door silencers Type L03011 or L03021, depending on frame material, of white or light gray color, on each steel door frame, except at fire-rated frames and frames for sound-resistant doors. Furnish three mutes for single doors and two mutes for each pair of doors.

**2.27 PADLOCKS FOR VARIOUS DOORS, GATES AND HATCHES (NOT USED)****2.28 THERMOSTATIC TEMPERATURE CONTROL VALVE CABINETS (NOT USED)****2.29 HINGED WIRE GUARDS (FOR WINDOWS, DOORS AND TRANSOMS) AND WIRE PARTITION DOORS (NOT USED)****2.30 FINISHES**

- A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, closers, thresholds, etc., shall be as specified below under "Miscellaneous Finishes." For field painting (final coat) of ferrous hardware, see Section 09 91 00, PAINTING.
- B. 626 or 630: All surfaces, except where other finishes are specified.
- C. Miscellaneous Finishes:
  - 1. Hinges --exterior doors: 626 or 630.
  - 2. Hinges --interior doors: 652 or 630.

- 3. Door Closers: Factory-applied paint finish. Dull or Satin Aluminum color.
- 4. Thresholds: Mill-finish aluminum.
- 5. Other primed steel hardware: 600.
- D. Hardware Finishes for Existing Buildings: U.S. Standard finishes shall match finishes of hardware in (similar) existing spaces except where otherwise specified.
- E. Anti-microbial Coating: All hand-operated hardware (levers, pulls, push bars, push plates, paddles, and panic bars) shall be provided with an anti-microbial/anti-fungal coating that has passed ASTM E2180 tests. Coating to consist of ionic silver (Ag+). Silver ions surround bacterial cells, inhibiting growth of bacteria, mold, and mildew by blockading food and respiration supplies.

### 2.31 BASE METALS

- A. Apply specified U.S. Standard finishes on different base metals as following:

Finish	Base Metal
652	Steel
626	Brass or bronze
630	Stainless steel

## PART 3 - EXECUTION

### 3.1 HARDWARE HEIGHTS

- A. For existing buildings, locate hardware on doors at heights to match existing hardware. The Contractor shall visit the Project site, verify location of existing hardware and submit locations to VA COR for approval.

### 3.2 INSTALLATION

- A. Closer devices, including those with hold-open features, shall be equipped and mounted to provide maximum door opening permitted by building construction or equipment. Closers shall be mounted on side of door inside rooms, inside stairs, and away from corridors except bathroom and anteroom doors which shall have closer installed parallel arm on exterior side of doors. Where closers are mounted on doors they shall be mounted with sex nuts and bolts; foot shall be fastened to frame with machine screws.
- B. Hinge Size Requirements:

Door Thickness	Door Width	Hinge Height
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45 mm (1-3/4 inch)	900 mm (3 feet) and less	113 mm (4-1/2 inches)
45 mm (1-3/4 inch)	Over 900 mm (3 feet) but not more than 1200 mm (4 feet)	125 mm (5 inches)
35 mm (1-3/8 inch) (hollow core wood doors)	Not over 1200 mm (4 feet)	113 mm (4-1/2 inches)

C. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim and surrounding conditions.

D. Where new hinges are specified for new doors in existing frames or existing doors in new frames, sizes of new hinges shall match sizes of existing hinges; or, contractor may reuse existing hinges provided hinges are restored to satisfactory operating condition as approved by COR. Existing hinges shall not be reused on door openings having new doors and new frames. Coordinate preparation for hinge cut-outs and screw-hole locations on doors and frames.

E. Hinges Required Per Door:

Doors 1500 mm (5 ft) or less in height	2 butts
Doors over 1500 mm (5 ft) high and not over 2280 mm (7 ft 6 in) high	3 butts
Doors over 2280 mm (7 feet 6 inches) high	4 butts
Dutch type doors	4 butts
Doors with spring hinges 1370 mm (4 feet 6 inches) high or less	2 butts
Doors with spring hinges over 1370 mm (4 feet 6 inches)	3 butts

F. Fastenings: Suitable size and type and shall harmonize with hardware as to material and finish. Provide machine screws and lead expansion shields to secure hardware to solid masonry. Fiber or "Rawl" plugs and adhesives are not permitted. All fastenings exposed to weather shall be of nonferrous metal.

G. After locks have been installed; show in presence of COR that keys operate their respective locks in accordance with keying requirements. (All keys, Master Key level and above shall be sent Registered Mail to the Medical Center Director along with the bitting list. Also a copy of the invoice shall be sent to the COR for his records.) Installation of locks which do not meet specified keying requirements shall be

considered sufficient justification for rejection and replacement of all locks installed on Project.

### **3.3 FINAL INSPECTION**

- A. Installer to provide letter to COR that upon completion, installer has visited the Project and has accomplished the following:
  - 1. Re-adjust hardware.
  - 2. Evaluate maintenance procedures and recommend changes or additions, and instruct VA personnel.
  - 3. Identify items that have deteriorated or failed.
  - 4. Submit written report identifying problems.

### **3.4 DEMONSTRATION**

- A. Demonstrate efficacy of mechanical hardware and electrical, and electronic hardware systems, including adjustment and maintenance procedures, to satisfaction of COR and VA Locksmith.

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**SECTION 08 71 13**  
**AUTOMATIC DOOR OPERATORS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies equipment, controls and accessories for automatic operation of swing doors.

**1.2 RELATED WORK**

- A. Door hardware not specified in this Section; Section 08 71 00, DOOR HARDWARE.
- B. Section 28 13 00, PHYSICAL ACCESS CONTROL SYSTEMS.
- C. Glass and glazing of doors and frames; Section 08 80 00, GLAZING.
- D. Electric general wiring, connections and equipment requirements; Division 26, ELECTRICAL.
- E. Section 28 31 00, FIRE DETECTION AND ALARM.

**1.3 QUALITY ASSURANCE**

- A. Automatic door operators, controls and other equipment shall be products of a manufacturer regularly engaged in manufacturing such equipment for a minimum of three years.
- B. One type of automatic door equipment shall be used throughout the Project.
- C. Equipment installer shall have specialized experience and shall be approved by the manufacturer.

**1.4 WARRANTY**

- A. Automatic door operators shall be subject to the terms of the "Warranty of Construction", FAR clause 52.246-21, except that the Warranty period shall be two years in lieu of one year.

**1.5 MAINTENANCE MANUALS**

- A. In accordance with Section 01 00 00, GENERAL REQUIREMENTS Article entitled "INSTRUCTIONS," furnish maintenance manuals and instructions on automatic door operators.

**1.6 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's literature and data describing operators, power units, controls, door hardware and safety devices.
- C. Shop Drawings:
  - 1. Showing location of controls and safety devices in relationship to each automatically operated door.

2. Showing layout, profiles, product components, including anchorage, accessories, as applicable.
  3. Submit templates, wiring diagrams, fabrication details and other information to coordinate the proper installation of the automatic door operators.
- D. Submit in writing to COR that items listed in Article 1.3 are in compliance.

#### **1.7 DESIGN CRITERIA**

- A. As a minimum automatic door equipment shall comply with the requirements of BHMA 156.10. Except as otherwise noted on drawings, provide operators which will move the doors from the fully closed to fully opened position in three seconds maximum time interval, when speed adjustment is at maximum setting.
- B. Equipment: Conforming to UL 325. Provide key-operated power disconnect wall switch for each door installation.
- C. Electrical Wiring, Connections and Equipment: Provide all motor, starter, controls, associated devices, and interconnecting wiring required for the installation. Equipment and wiring shall be as specified in Division 26, ELECTRICAL.

#### **1.8 APPLICABLE PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Builders Hardware Manufacturers Association, Inc. (BHMA):  
A156.10-05.....Power Operated Pedestrian Doors (BHMA 1601)
- C. National Fire Protection Association (NFPA):  
101-09.....Life Safety Code
- D. Underwriters Laboratory (UL):  
325-10.....Door, Drapery, Gate, Louver, and Window  
Operators and Systems

#### **1.9 DELIVERY AND STORAGE**

- A. Delivery shall be in factory's original, unopened, undamaged container with identification labels attached.

### **PART 2 - PRODUCTS**

#### **2.1 SWING DOOR OPERATORS**

- A. General: Swing door operators shall be of institutional type, door panel size 600 mm to 1250 mm (2'-0" to 5'-0") width, weight not to exceed 300 kg (600 pounds), electric operated for overhead mounting

within the header or transom. Furnish metal mounting supports, brackets and other accessories necessary for the installation of operators at the head of the door frames. The motor on automatic door operator shall be provided with an interlock so that the motor will not operate when doors are electrically locked from opening.

- B. Operators shall have checking mechanism providing cushioning action at last part of door travel, in both opening and closing cycle. Operators shall be capable of recycling doors instantaneously to full open position from any point in the closing cycle when control switch is activated. Operators shall, when automatic power is interrupted or shut-off, permit doors to easily open manually without damage to automatic operator system.
- C. Operator, enclosed in housing, shall open door by energizing motor and shall stop by electrically reducing voltage and stalling motor against mechanical stop. Door shall close by means of spring energy, and close force shall be controlled by gear system and motor being used as dynamic break without power, or controlled by hydraulic closer in electro-hydraulic operators. System shall operate as manual door control in event of power failure. Opening and closing speeds shall be adjustable:
  - 1. Operator Housing: Housing shall be a minimum of 112 mm (4-1/2 inches) wide by 140 mm (5.5 inches) high aluminum extrusions with enclosed end caps for application to 100 mm (4 inches) and larger frame systems. All structural sections shall have a minimum thickness of 3.2 mm (0.125 inch) and be fabricated of a minimum of 6063-T5 aluminum alloy.
  - 2. Power Operator: Completely assembled and sealed unit which shall include gear drive transmission, mechanical spring and bearings, all located in aluminum case and filled with special lubricant for extreme temperature conditions. Complete unit shall be rubber mounted with provisions for easy maintenance and replacement, without removing door from pivots or frame.
  - 3. Connecting hardware shall have drive arm attached to door with a pin linkage rotating in a self-lubricating bearing. Door shall not pivot on shaft of operator.
  - 4. Electrical Control: Operator shall have a self contained electrical control unit, including necessary transformers, relays, rectifiers, and other electronic components for proper operation and switching

of power operator. All connecting harnesses shall have interlocking plugs.

## **2.2 MICROPROCESSOR CONTROLS**

- A. The system shall include a multi-function microprocessor control providing adjustable hold open time (1-30 seconds), LED indications for sensor input signals and operator status and power assist close options. Control shall be capable of receiving activation signals from any device with normally open dry contact output. All activation modes shall provide fully adjustable opening speed.
- B. The door shall be held open by low voltage applied to the continuous duty motor. The control shall include an adjustable safety circuit that monitors door operation and stops the opening direction of the door if an obstruction is sensed. The motor shall include a recycle feature that reopens the door if an obstruction is sensed at any point during the closing cycle. The control shall include a standard three position key switch with functions for ON, OFF, and HOLD OPEN, mounted on operator enclosure, door frame, or wall, as indicated in the architectural drawings.

## **2.3 SLIDING DOOR OPERATORS (NOT USED)**

## **2.4 POWER UNITS**

- A. Each power unit shall be self-contained, electric operated and independent of the door operator. Capacity and size of power circuits shall be in accordance with automatic door operator manufacturer's specifications and Division 26 - ELECTRICAL.

## **2.5 DOOR CONTROLS**

- A. Opening and closing actions of doors shall be actuated by controls and safety devices specified, and conform to ANSI 156.10. Controls shall cause doors to open instantly when control device is actuated; hold doors in open positions; then, cause doors to close, unless safety device or reactivated control interrupts operation.
- B. Manual Controls:
  - 1. Push Plate Wall Switch: Recess type, stainless steel push plate minimum 100 mm by 100 mm (4-inch by 4-inch), with 13 mm (1/2-inch) high letters "To Operate Door--Push" engraved on face of plate.
- C. Motion Detector: The motion detector may be surface-mounted or concealed, to provide a signal to actuate the door operator, and monitor the immediate zone, to detect intrusion by persons, carts or similar objects. The zone which the detector monitors shall be 1500 mm

(5 feet) deep and 1500 mm (5 feet) across, plus or minus 150 mm (6 inches) on all dimensions. The maximum response time shall be no less than 25 milliseconds. Unit shall be designed to operate on 24 volts AC. The control shall not be affected by cleaning material, solvents, dust, dirt and outdoor weather conditions.

## **2.6 SAFETY DEVICES**

- A. General: Area over which doors swing shall be a safety section and anyone standing in path of door's movement shall be protected by a safety device.
- B. Each swing door shall have installed on the pull side a presence sensor to detect any person standing in the door swing path and prevent the door from opening.
- C. Time delay switches shall be adjustable between 3 to 60 seconds and shall control closing cycle of doors.
- D. Decals with sign "In" or "Do Not Enter" shall be installed on both faces of each door where shown.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Coordinate installation of equipment with other related work. Manual controls and power disconnect switches shall be recessed or semi-flush mounted in partitions. Secure operator components to adjacent construction with suitable fastenings. Conceal conduits, piping, and electric equipment, in finish work.
- B. Install power units in locations shown. Where units are to be mounted on walls, provide metal supports or shelves for the units. All equipment, including time delay switches, shall be accessible for maintenance and adjustment.
- C. Operators shall be adjusted and must function properly for the type of traffic (pedestrians, carts, stretchers and wheelchairs) expected to pass through doors. Each door leaf of pairs of doors shall open and close in synchronization. On pairs of doors, operators shall allow either door to be opened manually without the other door opening.
- D. Install controls at positions shown and make them convenient for particular traffic expected to pass through openings. Maximum height of push plate wall switches from finished floors shall be 40 inches unless otherwise approved by the COR.

### 3.2 INSTRUCTIONS

- A. Following the installation and final adjustments of the door operators, the installer shall fully instruct VA personnel for 2 hours on the operating, servicing, and safety requirements for the swing automatic door operators.
- B. Coordinate instruction to VA personnel with COR.

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**SECTION 08 80 00  
GLAZING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

A. This Section specifies the following:

1. Glass.
2. Plastic glazing.
3. Switchable privacy glass and control system.
4. Glazing materials and accessories for both factory- and field-glazed assemblies.
5. Interior glazing units with integral louvers.

**1.2 RELATED WORK:**

1. Sound-Resistant Doors: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES, and Section 08 14 00, INTERIOR WOOD DOORS.
2. Mirrors: Section 10 28 00, TOILET, BATH, AND LAUNDRY ACCESSORIES.
3. Sliding-Glass Counter-Mounted Pass Windows: Section 08 56 19, PASS WINDOWS.
4. Access Control Systems: Section 28 13 11, PHYSICAL ACCESS CONTROL SYSTEMS.
5. Wiring (120 V AC, 15A or 20A): Section 26 05 19, LOW VOLTAGE ELECTRICAL POWER AND CONDUCTORS AND CABLES.
6. Junction and Switch Boxes: Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS.

**1.3 LABELS:**

A. Temporary labels:

1. Provide temporary label on each light of glass and plastic material identifying manufacturer or brand and glass type, quality and nominal thickness.
2. Label in accordance with NFRC label requirements.
3. Temporary labels are to remain intact until glass and plastic material is approved by Contracting Officer Representative (COR).

B. Permanent labels:

1. Locate in corner for each pane.
2. Label in accordance with ANSI Z97.1 and SGCC label requirements.
  - a. Tempered glass.
  - b. Laminated glass or have certificate for panes without permanent label.
3. Fire-rated glazing assemblies: Mark in accordance with IBC.

**1.4 PERFORMANCE REQUIREMENTS:**

- A. General: Design glazing system consistent with guidance and practices presented in the GANA Glazing Manual, GANA Laminated Glazing Manual, and GANA Sealant Manual, as applicable to Project. Installed glazing is to withstand applied loads, thermal stresses, thermal movements, building movements, permitted tolerances, and combinations of these conditions without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; unsafe engagement of the framing system; deflections beyond specified limits; or other defects in construction.
- B. Glazing Unit Design: Design glass, including engineering analysis meeting requirements of authorities having jurisdiction. Thicknesses listed are minimum. Coordinate thicknesses with framing system manufacturers.
  - 1. Design glass in accordance with ASTM E1300, and for conditions beyond the scope of ASTM E1300, by a properly substantiated structural analysis.
  - 2. Design Wind Pressures: In accordance with ASCE 7.
  - 3. Wind Design Data: In accordance with ASCE 7.
  - 4. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than the structural capacity of the glazing unit, the threshold at which frame engagement is no longer safely assured, 1/100 times the short-side length, or 19 mm (0.75 inch), whichever is less.

**1.5 SUBMITTALS:**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Certificates:
  - 1. Certificate stating that fire-protection and fire-resistive glazing units meet code requirements for fire-resistance-rated assembly and applicable safety glazing requirements.
  - 2. Certificate on solar heat gain coefficient (match existing).
  - 3. Certificate on "R" value (match existing).
- C. Manufacturer Warranty.
- D. Manufacturer's Literature and Data:
  - 1. Glass, each kind required.



2. Insulating glass units.
  3. Elastic compound for metal sash glazing.
  4. Glazing cushion.
  5. Sealing compound.
  6. Plastic glazing material, each type required.
- E. Preconstruction Adhesion and Compatibility Test Report: Submit glazing sealant manufacturer's test report indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

#### **1.6 DELIVERY, STORAGE AND HANDLING:**

- A. Delivery: Schedule delivery to coincide with glazing schedules so minimum handling of crates is required. Do not open crates except as required for inspection for shipping damage.
- B. Storage: Store cases according to printed instructions on case, in areas least subject to traffic or falling objects. Keep storage area clean and dry.
- C. Handling: Unpack cases following printed instructions on case. Stack individual windows on edge leaned slightly against upright supports with separators between each.
- D. Protect laminated glazing units against face and edge damage during entire sequence of fabrication, handling, and delivery to installation location. Provide protective covering on exposed faces of glazing plastics:
  1. Treat glazing as fragile merchandise, and packaged and shipped in export wood cases with width end in upright position and blocked together in a mass. Storage and handling to comply with manufacturer's directions and as required to prevent edge damage or other damage to glazing resulting from effects of moisture, condensation, temperature changes, direct exposure to sun, other environmental conditions, and contact with chemical solvents.
  3. Temporary protections: The polycarbonate glazing to be temporarily protected with compatible, peelable, heat-resistant film which will be peeled for inspections and re-applied and finally removed after doors and windows are installed at destination. Since many adhesives will attack polycarbonate, the film used on exposed polycarbonate surfaces is to be approved and applied by manufacturer.
  4. Edge protection: To cushion and protect polycarbonate edges from contamination or foreign matter, the four (4) edges are to be sealed

the depth of glazing with continuous standard-thickness thermoplastic rubber tape. Alternatively, continuous channel shaped extrusion of thermoplastic rubber are to be used, with flanges extending into face sides of glazing.

5. Protect "Constant Temperature" units from exposures to ambient temperatures outside the range of 16 to 24 degrees C (60 to 75 degrees F), during the fabricating, handling, shipping, storing, installation, and subsequent protection of glazing.

#### **1.7 PROJECT CONDITIONS:**

- A. Field Measurements: Field-measure openings before ordering tempered glass products or assume responsibility for proper fit of field-measured products.

#### **1.8 WARRANTY:**

- A. Construction Warranty: Comply with the FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their glazing from the date of installation and final acceptance by the Government as follows. Submit manufacturer warranty.
  1. Plastic material to remain visibly clear without discoloration for 10 years.
  2. Insulating glass units to remain sealed for ten (10) years.
  3. Laminated glass units to remain laminated for five (5) years.
  4. Polycarbonate to remain clear and ultraviolet-light-stabilized for five (5) years.

#### **1.9 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Architectural Manufacturers Association (AAMA):
  - 800.....Test Methods for Sealants
  - 810.1-77.....Expanded Cellular Glazing Tape
- C. American National Standards Institute (ANSI):
  - Z97.1-14.....Safety Glazing Material Used in  
Building - Safety Performance Specifications  
and Methods of Test
- D. American Society of Civil Engineers (ASCE):
  - 7-10.....Wind Load Provisions
- E. ASTM International (ASTM):

- C864-05(R2011).....Dense Elastomeric Compression Seal Gaskets,  
Setting Blocks, and Spacers
- C920-14a.....Elastomeric Joint Sealants
- C1036-11(R2012).....Flat Glass
- C1048-12.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated  
and Uncoated Glass.
- C1172-14.....Laminated Architectural Flat Glass
- C1349-10.....Standard Specification for Architectural Flat  
Glass Clad Polycarbonate
- D1003-13.....Haze and Luminous Transmittance of Transparent  
Plastics
- E119-14.....Standard Test Methods for Fire Test of Building  
Construction and Material
- E1300-12a.....Load Resistance of Glass in Buildings
- F. Code of Federal Regulations (CFR):
- 16 CFR 1201-10.....Safety Standard for Architectural Glazing  
Materials
- G. Glass Association of North America (GANA):
- 2010 Edition.....GANA Glazing Manual
- 2008 Edition.....GANA Sealant Manual
- 2009 Edition.....GANA Laminated Glazing Reference Manual
- H. International Code Council (ICC):
- IBC.....International Building Code
- I. Insulating Glass Certification Council (IGCC)
- J. Insulating Glass Manufacturer Alliance (IGMA):
- TB-3001-13.....Guidelines for Sloped Glazing
- TM-3000.....North American Glazing Guidelines for Sealed  
Insulating Glass Units for Commercial and  
Residential Use
- K. Intertek Testing Services - Warnock Hersey (ITS-WHI)
- L. National Fire Protection Association (NFPA):
- 80-13.....Fire Doors and Other Opening Assemblies
- 252-12.....Fire Tests of Door Assemblies
- 257-12.....Standard on Fire Test for Window and Glass  
Block Assemblies
- M. National Fenestration Rating Council (NFRC)
- N. Safety Glazing Certification Council (SGCC) 2012:  
Certified Products Directory (Issued Semi-Annually).

O. Underwriters Laboratories, Inc. (UL):

9-08(R2009).....Fire Tests of Window Assemblies

263-14.....Fire Tests of Building Construction and  
Materials

## **PART 2 - PRODUCT**

### **2.1 GLASS - GENERAL**

A. Provide minimum thickness stated and as additionally required to meet performance requirements.

1. Provide minimum 6 mm (1/4 inch) thick glass units unless otherwise indicated.

B. Obtain glass units from single source from single manufacturer for each glass type.

C. Clear Glass:

1. ASTM C1036, Type I, Class 1, Quality q3.

D. Ultra-clear-Low-Iron Float Glass:

1. ASTM C1036, Type I, Class 1, Quality q3 and with visible light transmission of not less than 90 percent.

### **2.2 HEAT-TREATED GLASS:**

A. Roller Wave Limits for Heat-Treated Glass: Orient all roller wave distortion parallel to bottom surface of glazing, and provide units complying with the following limitations:

1. Measurement Parallel to Line: Maximum peak to valley 0.203 mm (0.008 inch).

2. Measurement Perpendicular to Line: Maximum 0.0254 mm (0.001 inch).

3. Bow/Warp: Maximum 50 percent of bow and warp allowed by ASTM C1048.

B. Clear Heat Strengthened Glass: Not used.

C. Tinted Heat Strengthened Glass: Not used.

D. Clear Tempered Glass ("T.2.2.D"):

1. ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.

E. Tinted Tempered Glass: Not used.

F. Tempered Patterned Glass: Not used.

### **2.3 COATED GLASS (NOT USED)**

### **2.4 ELECTROCHROMIC COATED GLASS (NOT USED)**

### **2.5 PLASTIC GLAZING:**

A. Clear Acrylic Sheet: Not used.

B. Clear Acrylic Sheet, Abrasion Resistant: Not used.

C. Clear Polycarbonate Sheet: Not used.

D. Clear Laminated Polycarbonate Sheet ("BR.2.8.E"):

1. ASTM C1349, Appendix X1, Type II, (coated mar-resistant, UV-stabilized), with coating on both exposed sides. Flame spread of 10 or less when tested per ASTM E84. Construction:
  - a. Outboard Lite: 3/16-inch-thick clear polycarbonate sheet with abrasion-resistant surface.
  - b. Interlayer: Urethane.
  - c. Inboard Lite: 3/16-inch-thick clear polycarbonate sheet with abrasion-resistant surface.
2. Average Thickness 0.375 inch.
  - a. Tolerance: Plus 0.043 inch or minus 0.035 inch).
3. Weight: 2.3 pounds per square foot.
4. Visible Light Transmission (ASTM D1003): 78 percent.
5. Glazing Method: Compatible sealant or gasket as recommended by glazing manufacturer.
  - a. Do not use PVC gasket material.
  - b. Do not use setting blocks made from PVC, EPDM, or neoprene rubber materials.
6. Mount clear laminated polycarbonate sheet in operable aluminum-framed sash with mitered corners, continuous piano hinge, and a pair of tamper-resistant locking mechanisms on the opposite edge. Provide continuous aluminum angles to receive operable sash. Receiving angles shall accept piano hinge and provide lip for locking mechanisms. Miter intersections of receiving angles.
  - a. At fixed sidelites, equal-leg receiving angles shall be mounted to perimeter of existing framed opening. Free leg of aluminum angles shall not extend into opening farther than width of aluminum-framed sash.
  - b. At new door leaves, unequal-leg angles shall be mounted to face of door at edges of glazed opening. Short leg shall project from face of door only slightly beyond thickness of aluminum-framed sash (and diameter of piano hinge).
  - c. Finish: Clear-anodized.

## **2.6 LAMINATED GLASS:**

- A. Laminated Glass: ASTM C1172. Two or more lites of glass bonded with polyvinyl butyral, ionomeric polymer, or cast-in-place and cured-transparent-resin interlayer complying with interlayer manufacturer's written instructions.

- B. Interlayer: Use min. 0.75 mm (0.030 inch) thick interlayer for vertical glazing unless otherwise indicated in Construction Documents.

- 1. Clear interlayer ("A.2.6.A.1").

## **2.7 SECURITY GLAZING ASSEMBLY (NOT USED)**

## **2.8 INSULATING GLASS UNITS:**

- A. Provide factory-fabricated, hermetically sealed glass unit consisting of two panes of glass separated by a dehydrated air space and comply with ASTM E2190.

- B. Assemble units using glass types.

- 1. Insulating Glass Units in New Door Leaves ("SEU.2.8.B.1"): Match appearance, solar heat gain coefficient, and R-value of existing insulating glass units in adjoining fixed lites.

## **2.9 FIRE PROTECTION AND FIRE RESISTANCE GLAZING:**

- A. Fire-Protection-Rated Glazing: Not used.

- B. Fire-Resistance-Rated Glazing ("F.2.10.C"): Glazing units tested for use in fire wall assemblies, UL, ITS-WHI or equivalent listed and labeled by testing agency in accordance with IBC for fire-resistance ratings of wall assemblies as indicated on Construction Documents, based upon testing according to NFPA 252 and ASTM E119 or UL 263.

- 1. Labeling: Permanently label fire-resistance-rated glazing units in accordance with IBC.
- 2. Safety Glazing: Comply with 16 CFR 1201, Category II.
- 3. Fire-Resistance-Rated Laminated Glass with Intumescent Interlayers: Units made from multiple lites of uncoated, ultra-clear low-iron float glass, in intumescent interlayers, of thickness and rating scheduled.
- 4. Fire-Resistance-Rated Double Glazing Units with Gel Fill: Units made from two lites of uncoated, fully tempered, ultra-clear (low-iron) float glass, with perimeter metal spacer and edge seal forming cavity filled with clear, fully transparent, heat-absorbing gel, of thickness and fire-protection rating scheduled.

## **2.10 SWITCHABLE PRIVACY GLASS ("A.2.6.H"):**

- A. Laminated glass assembly for clear glass panes with polyvinyl butyral film (PVB) 0.76 mm (0.030 inch) (minimum) thick film on each side of polymer dispersed liquid crystal film (PDLC) core having electrical connections:

- 1. With voltage PDLC core becomes transparent.
- 2. Without voltage PDLC core becomes translucent.

**B. Electric Connections:**

1. Locate steel channel cap on one panel edges, integrally connected to glass panel.
2. Integrally connect flexible steel conduit, not less than 1800 mm (6 feet long), to steel channel cap. Provide threaded end fitting at free end.
3. Integrally connect type TFFN or THHN number 18 AWG minimum size to panel with not less than 150 mm (6 inches) extending beyond flexible conduct end.

**C. Power Conditioner:**

1. Designed to provide square wave electrical power to discharge the PDLC film, suppress voltage surges and transients, reduces in rush current, and discharge the PDLC film.
2. Operate from 120 volt AC, 60 Hz input.

**D. Provide switchable privacy glass assembly listed by UL in Building Materials Directory or other approved U.S. testing laboratory bearing permanent mark of approval.****E. Switchable privacy glass:**

1. Both panes ASTM C1048, Kind HS, Condition A, Type I, Class 1, Quality q3, 4.8 mm (3/16 inch) thick.
2. Size as indicated.
3. Thickness as indicated.

**2.11 INSULATING PLASTIC SHEETS (NOT USED)****2.12 GLAZING ACCESSORIES:****A. As required to supplement the accessories provided with the items to be glazed and to provide a complete installation. Ferrous metal accessories exposed in the finished work are to have a finish that will not corrode or stain while in service. Fire rated glazing to be installed with glazing accessories in accordance with the manufacturer's installation instructions.****B. Setting Blocks: ASTM C864:**

1. Silicone type.
2. Channel shape; having 6 mm (1/4 inch) internal depth.
3. Shore A hardness of 80 to 90 Durometer.
4. Block lengths: 50 mm (2 inches) except 100 to 150 mm (4 to 6 inches) for insulating glass.
5. Block width: Approximately 1.6 mm (1/16 inch) less than the full width of the rabbet.

6. Block thickness: Minimum 4.8 mm (3/16 inch). Thickness sized for rabbet depth as required.

C. Spacers: ASTM C864:

1. Channel shape having a 6 mm (1/4 inch) internal depth.
2. Flanges not less 2.4 mm (3/32 inch) thick and web 3 mm (1/8 inch) thick.
3. Lengths: 25 to 76 mm (1 to 3 inches).
4. Shore A hardness of 40 to 50 Durometer.

D. Glazing Tapes:

1. Semi-solid polymeric based closed cell material exhibiting pressure-sensitive adhesion and withstanding exposure to sunlight, moisture, heat, cold, and aging.
2. Shape, size and degree of softness and strength suitable for use in glazing application to prevent water infiltration.
3. Complying with AAMA 800 for the following types:
  - a. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  - b. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

E. Spring Steel Spacer: Galvanized steel wire or strip designed to position glazing in channel or rabbeted sash with stops.

F. Glazing Gaskets: ASTM C864:

1. Firm dense wedge shape for locking in sash.
2. Soft, closed cell with locking key for sash key.
3. Flanges may terminate above the glazing-beads or terminate flush with top of beads.

G. Glazing Sealants: ASTM C920, silicone neutral cure:

1. Type S.
2. Class 25 or 50 as recommended by manufacturer for application.
3. Grade NS.
4. Shore A hardness of 25 to 30 Durometer.

H. Color:

1. Color of glazing compounds, gaskets, and sealants which will be exposed in the finished work and unpainted are to be black, gray, or a neutral color.

## **2.13 INTERIOR WALL GLAZING UNITS WITH INTEGRAL LOUVERS ("T.2.13")**

- A. Glazing thickness shall be determined by unit manufacturer according to application and sizes of units as indicated on the Drawings.



- B. Exterior Lite: 1/4-inch-thick clear tempered safety glass.
- C. Desiccant Air Space between Lites:
  - 1. Hermetically sealed with 2-1/2-inch aluminum spacer.
  - 2. Containing 1-3/8-inch wide manually operated louver blades.
- D. Interior Lite: 1/4-inch-thick clear tempered safety glass.
- E. Overall Unit Thickness: 3 inches.

**2.14 INTERIOR DOOR GLAZING UNITS WITH INTEGRAL LOUVERS (WITH TRIM KIT)  
("T.2.14")**

- A. Glazing thickness shall be determined by unit manufacturer according to application and sizes of units as indicated on the Drawings.
- B. Exterior Lite: 4mm-thick clear tempered safety glass.
- C. Desiccant Air Space between Lites:
  - 1. Hermetically sealed with 1-inch aluminum spacer.
  - 2. Containing 3/16-inch-thick by 7/8-inch-wide manually operated louver blades.
- D. Interior Lite: 4mm-thick clear tempered safety glass.
- E. Overall Unit Thickness: 1-5/16 inches.

**2.15 FABRICATION OF INTERIOR GLAZING UNITS WITH INTEGRAL LOUVERS**

- A. Frame Construction: Corrosion-resistant aluminum.
- B. Louver Construction: Hollow extruded-aluminum airfoil shape profiled to interlock with adjacent blades; Alloy 6063 and Temper T5.
- B. Secure louvers at both ends with molded pivots.
- C. Operation: Blades shall be rotatable 180 degrees in a continuous cycle. Louvers shall be operable without cords or strings. Provide manufacturer's standard, self-reversing black plastic thumbwheel accessible from both spaces.
  - 1. Wall Applications: The axle of the thumbwheel shall be positioned at 6-3/8 inches from the bottom of the panel, on the left or right as directed.
  - 2. Door Applications: The axle of the mechanism shall be positioned at 7-15/32 inches from the bottom of the panel, on the left or right as directed.
- D. Louver Color: Gray metallic.

**PART 3 - EXECUTION**

**3.1 EXAMINATION:**

- A. Verification of Conditions:

1. Examine openings for glass and glazing units; determine they are proper size; plumb; square; and level before installation is started.
2. Verify that glazing openings conform with details, dimensions and tolerances indicated on manufacturer is approved shop drawings.
- B. Review for conditions which may adversely affect glass and glazing unit installation, prior to commencement of installation. Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Verify that wash down of adjacent masonry is completed prior to erection of glass and glazing units.

### **3.2 PREPARATION:**

- A. For sealant glazing, prepare glazing surfaces in accordance with GANA Sealant Manual.
- B. Determine glazing unit size and edge clearances by measuring the actual unit to receive the glazing.
- C. Shop-fabricate and -cut glass with smooth, straight edges of full size required by openings to provide GANA-recommended edge clearances.
- D. Verify that components used are compatible.
- E. Clean and dry glazing surfaces.
- F. Prime surfaces scheduled to receive sealants, as determined by preconstruction sealant-substrate testing.

### **3.3 INSTALLATION - GENERAL:**

- A. Install in accordance with GANA Glazing Manual, GANA Sealant Manual, IGMA TB-3001, and IGMA TM-3000 unless specified otherwise.
- B. Glaze in accordance with recommendations of glazing and framing manufacturers, and as required to meet the Performance Test Requirements specified in other applicable sections of specifications.
- C. Set glazing without bending, twisting, or forcing of units.
- D. Do not allow glass to rest on or contact any framing member.
- E. Glaze doors and operable sash, in a securely fixed or closed and locked position, until sealant or glazing compound has thoroughly set.
- F. Tempered Glass: Install with roller distortions in horizontal position unless otherwise directed.
- G. Plastic:
  1. Use dry glazing method.
  2. Use only neoprene or EPDM gaskets.
- H. Laminated Glass:
  1. Tape edges to seal interlayer and protect from glazing sealants.

2. Do not use putty or glazing compounds.

I. Fire-Protective and Fireresistance-Rated Glass:

1. Glaze in accordance with manufacturer's installation instructions and NFPA 80.

**3.4 INSTALLATION - ELECTROCHROMIC GLAZING (NOT USED)**

**3.5 INSTALLATION - DRY METHOD (TAPE AND GASKET SPLINE GLAZING):**

- A. Cut glazing tape or spline to length; install on glazing pane. Seal corners by butting and sealing junctions with butyl sealant.
- B. Place setting blocks at 1/4 or 1/3 points with edge block no more than 150 mm (6 inches) from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- D. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Trim protruding tape edge.

**3.6 INSTALLATION - WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- A. Cut glazing tape to length and set against permanent stops, 5 mm (3/16 inch) below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- B. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
- C. Place setting blocks at 1/4 or 1/3 points with edge block no more than 152 mm (6 inches) from corners.
- D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to achieve full contact at perimeter of pane or glass unit.
- E. Install removable stops, with spacer strips inserted between glazing and applied stops, 6 mm (1/4 inch) below sight line. Place glazing tape on glazing pane or unit with tape flush with sight line.
- F. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, but not more than 9 mm (3/8 inch) below sight line. Sealant type is to be compatible with glazing tape.
- G. Apply cap bead of sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

**3.7 INSTALLATION - WET METHOD (SEALANT AND SEALANT):**

- A. Place setting blocks at 1/4 or 1/3 points and install glazing pane or unit.
- B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 600 mm (24 inch) intervals, 6 mm (1/4 inch) below sight line.
- C. Fill gaps between glazing and stops with sealant to depth of bite on glazing, but not more than 9 mm (3/8 inch) below sight line to ensure full contact with glazing and continue the air and vapor seal.
- D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

**3.8 INSTALLATION - EXTERIOR BUTT GLAZED METHOD (SEALANT ONLY) (NOT USED)****3.9 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT):**

- A. Cut glazing tape to length and install against permanent stops, projecting 1.6 mm (1/16 inch) above sight line.
- B. Place setting blocks at 1/4 or 1/3 points with edge block no more than 150 mm (6 inches) from corners.
- C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
- D. Install removable stops, spacer shims inserted between glazing and applied stops at 600 mm (24 inch) intervals, 6 mm (1/4 inch) below sight line.
- E. Fill gaps between pane and applied stop with sealant to depth equal to bite on glazing, to uniform and level line. Sealant type is to be compatible with glazing tape.
- F. Trim protruding tape edge.

**3.10 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND):**

- A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 600 mm (24 inch) centers, kept 6 mm (1/4 inch) below sight line.
- B. Locate and secure glazing pane using spring wire clips.
- C. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

**3.11 INSTALLATION - REGLAZING HISTORIC FRAMING (NOT USED)****3.12 COMMISSIONING - ELECTROCHROMIC GLAZING (NOT USED)****3.13 REPLACEMENT AND CLEANING:**

- A. Clean new glass surfaces removing temporary labels, paint spots, and defacement after approval by COR.

- B. Replace cracked, broken, and imperfect glass, or glass which has been installed improperly.
- C. Leave glass and setting material in clean, whole, and acceptable condition.

**3.14 PROTECTION:**

- A. Protect finished surfaces from damage during erection, and after completion of work. Strippable plastic coatings remaining on colored anodized finish are not acceptable.

**3.15 MONOLITHIC GLASS SCHEDULE (NOT USED)**

**3.16 LAMINATED GLASS SCHEDULE (NOT USED)**

**3.17 INSULATING GLASS SCHEDULE (NOT USED)**

**3.18 INSULATING LAMINATED GLASS SCHEDULE (FORCE PROTECTION AND PHYSICAL SAFETY) (NOT USED)**

**3.19 ELECTROCHROMIC LAMINATED INSULATING GLASS SCHEDULE (NOT USED)**

**3.20 FIRE-PROTECTIVE AND FIRE-RESISTANCE GLAZING SCHEDULE (NOT USED)**

**3.21 SECURITY GLAZING SCHEDULE (NOT USED)**

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**SECTION 08 90 00  
LOUVERS AND VENTS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

A. This Section specifies fixed wall louvers.

**1.2 RELATED WORK (NOT USED)**

**1.3 SUBMITTALS:**

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings:

1. Each type, showing material, finish, size of members, method of assembly, and installation and anchorage details.

C. Manufacturer's Literature and Data:

1. Each type of louver.

D. Color samples.

**1.4 APPLICABLE PUBLICATIONS:**

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. The Master Painters Institute (MPI):

Approved Product List - Updated Monthly

C. ASTM International (ASTM):

B221-14.....Aluminum and Aluminum Alloy Extruded Bars,  
Rods, Wire, Shapes, and Tubes

B221M-13.....Aluminum and Aluminum Alloy Extruded Bars,  
Rods, Wire, Shapes, and Tubes (Metric)

D1187/D1187M-97(R2011)..Asphalt-Base Emulsions for Use as Protective  
Coatings for Metal

D. National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500-06.....Metal Finishes Manual

E. American Architectural Manufacturers Association (AAMA):

2605-13.....High Performance Organic Coatings on  
Architectural Extrusions and Panels

F. Air Movement and Control Association, Inc. (AMCA):

500-L-07.....Testing Louvers

**PART 2 - PRODUCTS**

**2.1 MATERIALS:**

A. Aluminum, Extruded: ASTM B221M (B221).

- B. Fasteners: Fasteners for securing louvers to adjoining construction, except as otherwise specified or indicated in Construction Documents, to be toggle or expansion bolts of size and type as required for each specific type of installation and service condition.
  - 1. Where type, size, or spacing of fasteners is not shown or specified, submit Shop Drawings showing proposed fasteners, and method of installation.
  - 2. Fasteners for louvers, louver frames, and wire guards to be of stainless steel or aluminum with same finish as louvers.
- C. Bituminous Coating: ASTM D1187/D1187M; cold-applied asphalt mastic emulsion.

## **2.2 EXTERIOR WALL LOUVERS:**

- A. General:
  - 1. Provide fixed type louvers of size and design shown.
  - 2. Heads, sills, and jamb sections are to have formed caulking slots or be designed to retain caulking. Head sections are to have exterior drip lip, and sill sections an integral water stop.
  - 3. Furnish louvers with sill extension or separate sill as shown.
  - 4. Frame is to be mechanically fastened or welded construction with welds dressed smooth and flush.
- B. Performance Characteristics:
  - 1. Weather louvers are to have a minimum of 54-percent free area and to pass 5334 mm/s (1050 fpm) free area velocity at a pressure drop not exceeding 3.81 mm (0.15 inch) water gage and carry not more than 3.1 g (0.02 ounces) of water per square meter (square foot) of free area for 15 minutes when tested per AMCA Standard 500-L.
  - 2. Louvers are to bear AMCA certified rating seals for air performance and water penetration ratings.
- C. Aluminum Louvers:
  - 1. General: Frames, blades, sills, and mullions (sliding interlocking type); 2 mm (0.078-inch) thick extruded 6063-T5 or -T52 aluminum. Blades to be drainable type and have reinforcing bosses.
  - 2. Louvers, fixed: Make frame sizes 13 mm (1/2-inch) smaller than openings. Single louvers frames are not to exceed 1676 mm (66 inches) wide. When openings exceed 1676 mm (66 inches), provide twin louvers separated by mullion members.
  - 3. Louvers are to withstand the effects of gravity loads and the following wind loads and stresses within limits and under conditions



indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors.

- a. Wind load acting inward or outward of not less than 1436 Pa (30 lb. per sq. ft.).

### **2.3 CLOSURE ANGLES AND CLOSURE PLATES:**

- A. Fabricate from 2 mm (0.078-inch) thick stainless steel or aluminum.
- B. Provide continuous closure angles and closure plates on inside head, jambs and sill of exterior wall louvers.
- C. Secure angles and plates to louver frames with screws, and to masonry with fasteners as indicated in Construction Documents.

### **2.4 WIRE GUARDS:**

- A. Provide wire guards on outside of all exterior louvers, except on exhaust air louvers.
- B. Fabricate frames from 2 mm (0.078-inch) thick extruded or sheet aluminum designed to retain wire mesh.
- C. Wire mesh to be woven from not less than 1.6 mm (0.063-inch) diameter aluminum wire in 13 mm (1/2-inch) square mesh.
- D. Miter corners and join by concealed corner clips or locks extending not less than 57 mm (2-1/4 inches) into rails and stiles. Equip wire guards over 1219 mm (4 feet) in height with a mid-rail constructed as specified for frame components.
- E. Fasten frames to outside of louvers with aluminum devices of same finish as louvers designed to allow removal and replacement without damage to the wire guard or the louver.

### **2.5 BLANK-OFF PANELS:**

- A. Insulated laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver with clips on screws and gasketed or sealant sealed perimeter. Panel finish is to be same type of finish applied to louvers but black in color.
  - 1. Thickness: 50 mm (2 inches).
  - 2. Aluminum sheet for aluminum louver 0.81 mm (0.032 inch) minimum.
  - 3. Insulating Core: Extruded-polystyrene foam.

**2.6 EXTERIOR DOOR LOUVERS (NOT USED)****2.7 INTERIOR DOOR LOUVERS (NOT USED)****2.8 WALL VENTS (NOT USED)****2.9 AIR INTAKE VENTS (NOT USED)****2.10 BRICK VENTS (NOT USED)****2.11 FINISH:**

- A. In accordance with NAAMM Metal Finishes Manual: AMP 500-505
- B. Aluminum Louvers, Wire Guards, and Blank Off Panels:
  - 1. Organic Finish: AAMA 2605 (Fluorocarbon coating) with total dry-film thickness of not less than 0.03 mm (1.2 mil), color as selected by Architect from finish manufacturer's full range to match adjacent wall material.

**2.12 PROTECTION:**

- A. Provide protection for aluminum against galvanic action wherever dissimilar materials are in contact, by painting the contact surfaces of the dissimilar material with a heavy coat of bituminous coating (complete coverage), or by separating the contact surfaces with a performed synthetic rubber tape having pressure sensitive adhesive coating on one side.
- B. Isolate the aluminum from masonry by coating aluminum with zinc-chromate primer.
- C. Protect finished surfaces from damage during fabrication, erection, and after completion of the work. Strippable plastic coating on organic finish is not approved.

**PART 3 - EXECUTION****3.1 INSTALLATION:**

- A. Set work accurately, in alignment and where indicated in Construction Documents. Install plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Furnish setting drawings and instructions for installation of anchors and for the positioning of items having anchors to be built into masonry construction. Provide temporary bracing for such items until masonry is set.
- C. Provide anchoring devices and fasteners as shown and as necessary for securing louvers to building construction as specified. Power-actuated drive pins may be used, except for removal items and where members would be deformed or substrate damaged by their use.

- D. Set wall louvers in masonry walls during progress of the work. If wall louvers are not delivered to job in time for installation in prepared openings, make provision for later installation.

### **3.2 CLEANING AND ADJUSTING:**

- A. After installation, all exposed prefinished and plated items and all items fabricated from stainless steel and aluminum are to be cleaned as recommended by the manufacturer and protected from damage until completion of the Project.
- B. All movable parts, including hardware, are to be cleaned and adjusted to operate as designed without binding or deformation of the members, so as to be centered in the opening of frame, and where applicable, to have all contact surfaces fit tight and even without forcing or warping the components.
- C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Contracting Officer Representative (COR) damaged units and replace with new units.

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**SECTION 09 05 16**  
**SUBSURFACE PREPARATION FOR FLOOR FINISHES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies subsurface preparation requirements for areas to receive the installation of applied and resinous flooring. This section includes removal of existing floor coverings, testing concrete for moisture and pH, remedial floor coating for concrete floor slabs having unsatisfactory moisture or pH conditions, and floor leveling and repair as required.

**1.2 RELATED WORK**

- A. Section 07 92 00, JOINT SEALANTS.
- B. Section 09 65 16, RESILIENT SHEET FLOORING, Section 09 65 19, RESILIENT TILE FLOORING, and Section 09 68 00, CARPETING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA and TEST DATA.
- B. Written approval confirming product compatibility with subfloor material manufacturer and the flooring manufacturer
- C. Product Data:
1. Moisture remediation system
  2. Underlayment Primer
  3. Cementitious Self-Leveling Underlayment
  4. Cementitious Trowel-Applied Underlayment
- D. Test Data:
1. Moisture test and pH results performed by a qualified independent testing agency or warranty holding manufacturer's technical representative.

**1.4 DELIVERY AND STORAGE**

- A. Deliver materials in containers with labels legible and intact and grade-seals unbroken.
- B. Store material to prevent damage or contamination.

**1.5 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing and Materials (ASTM):

<b>D638-10</b> (2010)	Test Method for Tensile Properties of Plastics
<b>D4259-88</b> (2012)	Standard Practice for Abrading Concrete to alter the surface profile of the concrete and to remove foreign materials and weak surface laitance.
<b>C109/C109M</b> -12 (2012)	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens) Modified Air Cure Only
<b>D7234-12</b> (2012)	Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
<b>E96/E96M -</b> <b>12</b> (2012)	Standard Test Methods for Water Vapor Transmission of Materials
<b>F710-11</b> (2011)	Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
<b>F1869-11</b> (2011)	Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
<b>F2170-11</b> (2011)	Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
<b>C348-08</b> (2008)	Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars
<b>C191-13</b> (2013)	Standard Test Method for Time of Setting of Hydraulic Cement by Vicat Needle

## **PART 2 - PRODUCTS**

### **2.1 MOISTURE REMEDIATION COATING**

#### **A. System Descriptions:**

1. High-solids, epoxy system designed to suppress excess moisture in concrete prior to an overlayment. For use under resilient sheet flooring, resilient tile flooring, and carpet where issues caused by moisture vapor are a concern.

#### **B. Products:** Subject to compliance with applicable fire, health, environmental, and safety requirements for storage, handling, installation, and clean up.

#### **C. System Components:** Verify specific requirements as systems vary by manufacturer. Verify build up layers and installation method. Verify compatibility with substrate. Use manufacturer's standard components, compatible with each other and as follows:

1. Liquid applied coating:
  - a. Resin: epoxy.
  - b. Formulation Description: Multiple component high solids.

- c. Application: Per manufacturer's written installation requirements.
- d. Thickness: minimum 10 mils
- D. Material Vapor Permeance: Application shall achieve a permeance rating of less than 0.1 perm in accordance with ASTM E96/E96M.
- E. Maximum RH requirement: 100% testing in accordance with ASTM F2170.

Property	Test	Value
Tensile Strength	ASTM D638	4,400 psi
Volatile Organic Compound Limits (V.O.C.)	SCAMD Rule 1113	25 grams per liter
Permeance	ASTM E96	0.1 perms
Tensile Modulus	ASTM D638	1.9X10 <sup>5</sup> psi
Percent Elongation	ASTM D638	12%
Cure Rate	Per manufacture's Data	4 hours Tack free with 24hr recoat window
Bond Strength	ASTM D7234	100% bond to concrete failure

## 2.2 CEMENTITIOUS SELF-LEVELING UNDERLAYMENT

- A. System Descriptions:
  - 1. High performance self-leveling underlayment resurfacer. Single component, self-leveling, cementitious material designed for easy application as an underlayment for all types of flooring materials. It is used for substrate repair and leveling.
- B. Products: Subject to compliance with applicable fire, health, environmental, and safety requirements for storage, handling, installation, and clean up. Gypsum-based products are unacceptable.
- C. System Characteristics:
  - 1. Wearing Surface: smooth
  - 2. Thickness: Per architectural drawings, ranging from feathered edge to 1", per application. Applications greater than 1" require additional 3/8" aggregate to mix or as recommended by manufacturer.
- D. Underlayment shall be calcium aluminate cement-based, containing Portland cement. Gypsum-based products are unacceptable.
- E. Compressive Strength: Minimum 4100 psi in 28 days in accordance with ASTM C109/C109M.

- F. Flexural Strength: Minimum 1000 psi in 28 days in accordance with ASTM C348
- G. Dry Time: Underlayment shall receive the application of //moisture insensitive tile in 6 hours, // floor coverings in 16 hours, // and resinous flooring in 3-7 days. //
- H. Primer: compatible and as recommended by manufacturer for use over intended substrate
- I. System Components: Manufacturer's standard components that are compatible with each other and as follows:
1. Primer:
    - a. Resin: copolymer
    - b. Formulation Description: single component ready to use.
    - c. Application Method: Squeegee and medium nap roller.  
All puddles shall be removed, and material shall be allowed to dry, 1-2 hours at 70F/21C.
    - d. Number of Coats: (1) one.
  2. Grout Resurfacing Base:
    - a. Formulation Description: Single component, cementitious self-leveling high-early and high-ultimate strength grout.
    - b. Application Method: colloidal mix pump, cam rake, spike roll.
      - 1) Thickness of Coats: Per architectural scope, 1" lifts.
      - 2) Number of Coats: More than one if needed.
    - c. Aggregates: for applications greater than 1inch, require additional 3/8" aggregate to mix.

Property	Test	Value
Compressive Strength	ASTM C109/C109M	2,200 psi @ 24 hrs 3,000 psi @ 7 days
Initial set time Final Set time	ASTM C191	30-45 min. 1 to 1.5 hours
Bond Strength	ASTM D7234	100% bond to concrete failure

### **2.3 CEMENTITIOUS TROWEL-APPLIED UNDERLAYMENT (NOT SUITABLE FOR RESINOUS FLOOR FINISHES)**

- A. Underlayment shall be calcium aluminate cement-based, containing Portland cement. Gypsum-based products are unacceptable.
- B. Compressive Strength: Minimum 4000 psi in 28 days
- C. Trowel-applied underlayment shall not contain silica quartz (sand).



- D. Dry Time: Underlayment shall receive the application of floor covering in 15-20 minutes.

### **PART 3 - EXECUTION**

#### **3.1 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain ambient temperature of work areas at not less than 16 degree C (60 degrees F), without interruption, for not less than 24 hours before testing and not less than three days after testing.
- B. Maintain higher temperatures for a longer period of time where required by manufacturer's recommendation.
- C. Do not install materials when the temperatures of the substrate or materials are not within 60-85 degrees F/ 16-30 degrees C.

#### **3.2 SURFACE PREPARATION**

- A. Existing concrete slabs with existing floor coverings:
  - 1. Conduct visual observation of existing floor covering for adhesion, water damage, alkaline deposits, and other defects.
  - 2. Remove existing floor covering and adhesives. Comply with local, state and federal regulations and the RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to the floor covering being removed.
- B. Concrete shall meet the requirements of ASTM F710 and be sound, solid, clean, and free of all oil, grease, dirt, curing compounds, and any substance that might act as a bond-breaker before application. As required prepare slab by mechanical methods. No chemicals or solvents shall be used.
- C. General: Prepare and clean substrates according to flooring manufacturer's written instructions for substrate indicated.
- D. Prepare concrete substrates per ASTM D4259 as follows:
  - 1. Dry abrasive blasting.
  - 2. Wet abrasive blasting.
  - 3. Vacuum-assisted abrasive blasting.
  - 4. Centrifugal-shot abrasive blasting.
  - 5. Comply with manufacturer's written instructions.
- E. Repair damaged and deteriorated concrete according to flooring manufacturer's written recommendations.
- F. Verify that concrete substrates are dry.
- G. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission

rate of per flooring manufactures formal and project specific written recommendation.

- H. Perform in situ probe test, ASTM F2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity per flooring manufacture's formal and project specific written recommendation.
- I. Provide a written report showing test placement and results.
- J. Prepare joints in accordance with Section 07 92 00, JOINT SEALANTS and material manufacturer's instructions.
- K. Alkalinity: Measure surface pH in accordance with procedures provided in ASTM F710 or as outlined by qualified testing agency or flooring manufacturer's technical representative.
- L. Tolerances: Subsurface shall meet the flatness and levelness tolerance specified on drawings or recommended by the floor finish manufacturer. Tolerance shall also not to exceed 1/4" deviation in 10'. As required, install underlayment to achieve required tolerance.
- M. Other Subsurface: For all other subsurface conditions, such as wood or metal, contact the floor finish or underlayment manufacturer, as appropriate, for proper preparation practices.

### **3.3 MOISTURE REMEDIATION COATING:**

- A. Where results of relative humidity testing (ASTM F2170) exceed the requirements of the specified flooring manufacturer, apply remedial coating as specified to correct excessive moisture condition.
- B. Prior to remedial floor coating installation mechanically prepare the concrete surface to provide a concrete surface profile in accordance with ASTM D4259.
- C. Mix and apply moisture remediation coating in accordance with manufacturer's instructions.

### **3.4 CEMENTITIOUS UNDERLAYMENT:**

- A. Install cementitious self-leveling underlayment as required to correct surface defects, floor flatness or levelness corrections to meet the tolerance requirements as or detailed on drawings, address non-moving cracks or joints, provide a smooth surface for the installation of floor covering, or meet elevation requirements detailed on drawings.
- B. Mix and apply in accordance with manufacturer's instructions.

**3.5 PROTECTION**

- A. Prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, tempered hardwood, or other suitable protection course

**3.6 FIELD QUALITY CONTROL**

- A. Where specified, field sampling of products shall be conducted by a qualified, independent testing facility.

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**SECTION 09 22 16**  
**NON-STRUCTURAL METAL FRAMING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies steel studs wall systems, ceiling or soffit suspended or furred framing, wall furring, fasteners, and accessories for the screw attachment of gypsum board or other building boards.

**1.2 RELATED WORK**

- A. Support for wall-mounted items: Section 05 50 00, METAL FABRICATIONS.
- B. Ceiling suspension systems for acoustical panels and lay in gypsum board panels: Section 09 51 00, ACOUSTICAL CEILINGS and Section 09 29 00, GYPSUM BOARD.

**1.3 TERMINOLOGY**

- A. Description of terms shall be in accordance with ASTM C754, ASTM C11, ASTM C841, and as specified.
- B. Underside of Structure Overhead: In spaces where steel trusses or bar joists are shown, the underside of structure overhead shall be the underside of the floor or roof construction supported by beams, trusses, or bar joists. In interstitial spaces with walk-on floors the underside of the walk-on floor is the underside of structure overhead.
- C. Thickness of steel specified is the minimum bare (uncoated) steel thickness.

**1.4 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
1. Studs, runners, and accessories.
  2. Hanger inserts.
  3. Channels (Rolled steel).
  4. Furring channels.
  5. Screws, clips, and other fasteners.
- C. Shop Drawings:
1. Typical ceiling suspension system.
  2. Typical metal stud and furring construction system including details around openings and corner details.
  3. Typical fireresistance-rated assembly and column fireproofing showing details of construction same as that used in fireresistance-rating test.

- D. Test Results: Fire rating test designation, each fire rating required for each assembly.

## 1.5 DELIVERY, IDENTIFICATION, HANDLING AND STORAGE

In accordance with the requirements of ASTM C754.

## 1.6 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
- A123/A123M.....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- A641/A641M-09.....Zinc-Coated (Galvanized) Carbon Steel Wire
- A653/653M-11.....Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
- C11-10.....Terminology Relating to Gypsum and Related Building Materials and Systems
- C635/C635M-07.....Manufacture, Performance, and Testing of Metal Suspension System for Acoustical Tile and Lay-in Panel Ceilings
- C636/C636M-08.....Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
- C645-09.....Non-Structural Steel Framing Members
- C754-11.....Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
- C841-03(R2008).....Installation of Interior Lathing and Furring
- C954-10.....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
- E580/E580M-11.....Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Moderate Seismic Restraint.

## PART 2 - PRODUCTS

### 2.1 PROTECTIVE COATING

- A. Galvanize steel studs, runners (track), and rigid (hat section) furring channels, with coating designation of G-60 minimum, per ASTM A123/A123M.

**2.2 STEEL STUDS AND RUNNERS (TRACK)**

- A. ASTM C645, modified for thickness specified and sizes as shown.
  - 1. Use ASTM A653/A653M steel, 0.8 mm (0.0329-inch) thick bare metal (33 mil).
  - 2. Runners same thickness as studs.
- B. Provide not less than two cutouts in web of each stud, approximately 300 mm (12 inches) from each end, and intermediate cutouts on approximately 600 mm (24-inch) centers.
- C. Doubled studs for openings and studs for supporting concrete backer-board.
- D. Studs 3600 mm (12 feet) or less in length shall be in one piece.

**2.3 FURRING CHANNELS**

- A. Rigid Furring Channels (Hat Shape): ASTM C645.
- B. Rolled Steel Channels: ASTM C754, cold rolled; or, ASTM C841, cold rolled.

**2.4 FASTENERS, CLIPS, AND OTHER METAL ACCESSORIES**

- A. ASTM C754, except as otherwise specified.
- B. For fireresistance-rated construction: Type and size same as used in fireresistance-rating test.
- C. Fasteners for steel studs thicker than 0.84 mm (0.033-inch) thick. Use ASTM C954 steel drill screws of size and type recommended by the manufacturer of the material being fastened.
- D. Clips: ASTM C841 (paragraph 6.11), manufacturer's standard items. Clips used in lieu of tie wire shall have holding power equivalent to that provided by the tie wire for the specific application.
- E. Concrete ceiling hanger inserts (anchorage for hanger wire and hanger straps): Steel, zinc-coated (galvanized), manufacturers standard items, designed to support twice the hanger loads imposed and the type of hanger used.
- F. Tie Wire and Hanger Wire:
  - 1. ASTM A641, soft temper, Class 1 coating.
  - 2. Gage (diameter) as specified in ASTM C754 or ASTM C841.
- G. Attachments for Wall Furring:
  - 1. Manufacturers standard items fabricated from zinc-coated (galvanized) steel sheet.
  - 2. For masonry walls: Metal slots with adjustable inserts or adjustable wall furring brackets. Spacers may be fabricated from 1 mm (0.0396-inch) thick galvanized steel with corrugated edges.

- H. Power-Actuated Fasteners: Type and size as recommended by the manufacturer of the material being fastened.

## **2.5 SUSPENDED CEILING SYSTEM FOR GYPSUM BOARD (OPTION)**

- A. Pre-engineered, direct-hung system conforming to ASTM C635, heavy duty (HD), with not less than 35 mm (1-3/8 inch) wide knurled capped flange face designed for screw attachment of gypsum board.
- B. Wall track channel with 35 mm (1-3/8 inch) wide flange.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION CRITERIA**

- A. Where fireresistance-rated construction is required for walls, partitions, columns, beams and floor-ceiling assemblies, the construction shall be same as that used in fireresistance-rating test.
- B. Construction requirements for fireresistance-rated assemblies and materials shall be as shown and specified, the provisions of the Scope paragraph (1.2) of ASTM C754 and ASTM C841 regarding details of construction shall not apply.

### **3.2 INSTALLING STUDS**

- A. Install studs in accordance with ASTM C754, except as otherwise shown or specified.
- B. Space studs not more than 610 mm (24 inches) on center.
- C. Cut studs 6 mm to 9 mm (1/4 to 3/8-inch) less than floor to underside of structure overhead when extended to underside of structure overhead.
- D. Where studs are shown to terminate above suspended ceilings, provide bracing as shown or extend studs to underside of structure overhead.
- E. Extend studs to underside of structure overhead for fireresistance-rated partitions, smoke partitions, and soundrated partitions.
- F. Openings:
  - 1. Frame jambs of openings in stud partitions and furring with two studs placed back-to-back or as shown.
  - 2. Fasten back-to-back studs together with 9 mm (3/8-inch) long Type S pan head screws at not less than 600 mm (2 feet) on center, staggered along webs.
  - 3. Studs fastened flange-to-flange shall have splice plates on both sides approximately 50 X 75 mm (2 by 3 inches) screwed to each stud with two screws in each stud. Locate splice plates at 600 mm (24 inches) on center between runner tracks.



## G. Fastening Studs:

1. Fasten studs located adjacent to partition intersections, corners and studs at jambs of openings to flange of runner tracks with two screws through each end of each stud and flange of runner.
2. Do not fasten studs to top runner track when studs extend to underside of structure overhead.

## H. Chase Wall Partitions:

1. Locate cross braces for chase wall partitions to permit the installation of pipes, conduits, carriers and similar items.
2. Use studs or runners as cross bracing not less than 63 mm (2-1/2 inches wide).

## I. Form building seismic or expansion joints with double studs back-to-back spaced 75 mm (three inches) apart plus the width of the seismic or expansion joint.

## J. Form control joint, with double studs spaced 13 mm (1/2-inch) apart.

**3.3 INSTALLING WALL FURRING FOR FINISH APPLIED TO ONE SIDE ONLY**

## A. In accordance with ASTM C754, or ASTM C841 except as otherwise specified or shown.

## B. Wall furring-Stud System:

1. Framed with 63 mm (2-1/2 inch) or narrower studs, 600 mm (24 inches) on center.
2. Brace as specified in ASTM C754 for Wall Furring-Stud System or brace with sections or runners or studs placed horizontally at not less than three foot vertical intervals on side without finish.
3. Securely fasten braces to each stud with two Type S pan head screws at each bearing.

## C. Direct attachment to masonry or concrete; rigid channels:

1. Install rigid (hat section) furring channels at 600 mm (24 inches) on center, horizontally or vertically.
2. At corners where rigid furring channels are positioned horizontally, provide mitered joints in furring channels.
3. Ends of spliced furring channels shall be nested not less than 200 mm (8 inches).
4. Fasten furring channels to walls with power-actuated drive pins or hardened steel concrete nails. Where channels are spliced, provide two fasteners in each flange.

5. Locate furring channels at interior and exterior corners in accordance with wall finish material manufacturers printed erection instructions.

D. Installing Wall Furring-Bracket System: Space furring channels not more than 400 mm (16 inches) on center.

### **3.4 INSTALLING SUPPORTS REQUIRED BY OTHER TRADES**

A. Provide for attachment and support of electrical outlets, plumbing, laboratory or heating fixtures, recessed type plumbing fixture accessories, access panel frames, wall bumpers, wood seats, toilet stall partitions, dressing booth partitions, urinal screens, chalkboards, tackboards, wall-hung casework, handrail brackets, recessed fire extinguisher cabinets and other items like auto door buttons and auto door operators supported by stud construction.

B. Provide additional studs where required. Install metal backing plates, or special metal shapes as required, securely fastened to metal studs.

1. Install continuous galvanized metal strapping with a minimum uncoated thickness of 0.0635 inch (fka 16 gage) and a width of 6 inches for handrails, grab bars, and other accessories, fixtures, brackets, and miscellaneous specialties, as well as VA-furnished and Contractor-installed items, unless otherwise noted.

2. Provide galvanized metal strapping provided between studs in walls receiving cabinets, TVs, and display monitors (for installation). Blocking for TVs and display monitors shall be metal strapping with a minimum uncoated thickness of 0.0635 inch (fka 16 gage). See the elevations on the Drawings for the centerline above the finished floor.

### **3.5 INSTALLING SHAFT WALL SYSTEM (NOT USED)**

### **3.6 INSTALLING FURRED AND SUSPENDED CEILINGS OR SOFFITS**

A. Install furred and suspended ceilings or soffits in accordance with ASTM C754 or ASTM C841 except as otherwise specified or shown for screw attached gypsum board ceilings and for plaster ceilings or soffits.

1. Space framing at 400 mm (16-inch) centers for metal lath anchorage.

2. Space framing at 600 mm (24-inch) centers for gypsum board anchorage.

B. Where beams are more than 1200 mm (48 inches) apart, provide intermediate hangers so that spacing between supports does not exceed 1200 mm (48 inches). Use clips, bolts, or wire ties for direct attachment to steel framing.

- C. Existing concrete on steel decking:
  - 1. Use power-actuated fasteners either eye pin, threaded studs or drive pins for type of hanger attachment required.
  - 2. Install fasteners at approximate mid height of concrete beams. Do not install in bottom of beams.
- D. Installing suspended ceiling system for gypsum board (ASTM C635/C635M Option):
  - 1. Install only for ceilings to receive screw attached gypsum board.
  - 2. Install in accordance with ASTM C636/C636M. **Support by hanger wires spaced a maximum of 48 inches on center, attaching hanger wires directly to structure above. Do not attach to metal deck.**
    - a. Install main runners spaced a maximum of 1200 mm (48 inches) on center.
    - b. Install 1200 mm (four foot) tees not over 600 mm (24 inches) on center - but not less than recommended by grid manufacturer; locate for edge support of gypsum board.
    - c. Install perimeter wall track angle or channel where grid suspension systems meet vertical surfaces.
- E. Installing Ceiling Bracing System:
  - 1. Construct bracing of 38 mm (1-1/2 inch) channels for lengths up to 2400 mm (8 feet) and 50 mm (2 inch) channels for lengths over 2400 mm (8 feet) with ends bent to form surfaces for anchorage to carrying channels and overhead construction. Lap channels not less than 600 mm (2 feet) at midpoint back to back. Screw or bolt lap together with two fasteners.
  - 2. Install bracing at an approximate 45-degree angle to carrying channels and structure overhead; secure as specified to structure overhead with two fasteners and to carrying channels with two fasteners or wire ties.
  - 3. Brace suspended ceiling or soffit framing in seismic areas in accordance with ASTM E580/E580M.

### 3.7 TOLERANCES

- A. Fastening surface for application of subsequent materials shall not vary more than 3 mm (1/8-inch) from the layout line.
- B. Plumb and align vertical members within 3 mm (1/8-inch.)
- C. Level or align ceilings within 3 mm (1/8-inch.)

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**SECTION 09 29 00  
GYPSUM BOARD**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies installation and finishing of gypsum board.

**1.2 RELATED WORK**

- A. Installation of steel framing members for walls, partitions, furring, soffits, and ceilings: Section 09 22 16, NON-STRUCTURAL METAL FRAMING.
- B. Acoustical Insulation: Section 07 21 13, THERMAL INSULATION.
- C. Acoustical Sealants: Section 07 92 00, JOINT SEALANTS.

**1.3 TERMINOLOGY**

- A. Definitions and description of terms shall be in accordance with ASTM C11, C840, and as specified.
- B. Underside of Structure Overhead: In spaces where steel trusses or bar joists are shown, the underside of structure overhead shall be the underside of the floor or roof construction supported by the trusses or bar joists.
- C. "Yoked": Gypsum board cut out for opening with no joint at the opening (along door jamb or above the door).

**1.4 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
1. Cornerbead and edge trim.
  2. Finishing materials.
  3. Laminating adhesive.
  4. Gypsum board, each type.
- C. Shop Drawings:
1. Typical gypsum board installation, showing corner details, edge trim details and the like.
  2. Typical sound rated assembly, showing treatment at perimeter of partitions and penetrations at gypsum board.
  3. Typical fireresistance-rated assembly and column fireproofing, indicating details of construction same as that used in fireresistance-rating test.
- D. Samples:
1. Cornerbead.

- 2. Edge trim.
- 3. Control joints.

E. Test Results:

- 1. Fireresistance-rating test, each fireresistance rating required for each assembly.
- 2. Sound rating test.

F. Certificates: Certify that gypsum board types, gypsum backing board types, cementitious backer units, and joint treating materials do not contain asbestos material.

#### 1.5 DELIVERY, IDENTIFICATION, HANDLING AND STORAGE

A. In accordance with the requirements of ASTM C840.

#### 1.6 ENVIRONMENTAL CONDITIONS

A. In accordance with the requirements of ASTM C840.

#### 1.7 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American Society for Testing and Materials (ASTM):

C11-08.....Terminology Relating to Gypsum and Related  
Building Materials and Systems

C475/C475M-02.....Joint Compound and Joint Tape for Finishing  
Gypsum Board

C840-08.....Application and Finishing of Gypsum Board

C919-08.....Sealants in Acoustical Applications

C954-07.....Steel Drill Screws for the Application of  
Gypsum Board or Metal Plaster Bases to Steel  
Stud from 0.033 in. (0.84mm) to 0.112 in.  
(2.84mm) in thickness

C1002-07.....Steel Self-Piercing Tapping Screws for the  
Application of Gypsum Panel Products or Metal  
Plaster Bases to Wood Studs or Steel Studs

C1047-05.....Accessories for Gypsum Wallboard and Gypsum  
Veneer Base

C1658/C1658M-06.....Glass Mat Gypsum Panels

C1396/C1396M-06.....Gypsum Board

C1629/C1629M-14a.....Standard Classification for Abuse-Resistant  
Nondecorated Interior Gypsum Panel Products and  
Fiber-Reinforced Cement Panels

D3272-12.....Standard Test Method for Resistance to Growth  
of Mold on the Surface of Interior Coatings in  
an Environmental Chamber

E84-08.....Surface Burning Characteristics of Building  
Materials

E695-03.....Standard Test Method of Measuring Relative  
(Reapproved 2009) Resistance of Wall, Floor, and Roof  
Construction to Impact Loading

- C. Underwriters Laboratories Inc. (UL):  
Latest Edition.....Fire Resistance Directory
- D. Inchcape Testing Services (ITS):  
Latest Editions.....Certification Listings

## **PART 2 - PRODUCTS**

### **2.1 GYPSUM BOARD**

- A. Gypsum Board: ASTM C1396/C1396M, Type X, 16 mm (5/8 inch) thick unless shown otherwise. Shall contain a minimum of 20-percent recycled gypsum.
- B. Acoustic Sound-Absorbing Gypsum Board: CertainTeed Corporation, Saint Gobain Group; Gyptone BIG Line 6: [www.certainteed.com](http://www.certainteed.com) - or equivalent.
- C. Impact-Resistant Gypsum Board ("IR"): Tested to Level 3 soft-body per ASTM E695 and Level 3 hard-body impact per Annex I of ASTM C1629.
1. Application: Holding rooms.
    - a. Height: 48 inches above finished floor.
  2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
    - a. Compliance shall not be dependent on semi-gloss paint finish.
  3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
  4. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
  5. Hard Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
  6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  7. Paper-Faced Type: Gypsum board as defined in ASTM C1396/C1396M.
  8. Glass Mat-Faced Type: Gypsum wallboard as defined in ASTM C1658/C1658M.
  9. Core Type: Fireresistance-rated Type-X core, UL- or WH-listed.
  10. Thickness: 5/8 inch.

11. Edges: Tapered.

- D. Gypsum cores shall contain maximum percentage of post-industrial recycled gypsum content available in the area (a minimum of 95-percent post-industrial recycled gypsum content). Paper facings shall contain 100-percent post-consumer recycled paper content.

## **2.2 GYPSUM SHEATHING BOARD (NOT USED)**

## **2.3 ACCESSORIES**

- A. ASTM C1047, except form of 0.39 mm (0.015 inch) thick zinc coated steel sheet or rigid PVC plastic.
- B. Flanges not less than 22 mm (7/8 inch) wide with punchouts or deformations as required to provide compound bond.

## **2.4 FASTENERS**

- A. ASTM C1002 and ASTM C840, except as otherwise specified.
- B. ASTM C954, for steel studs thicker than 0.04 mm (0.33 inch).
- C. Select screws of size and type recommended by the manufacturer of the material being fastened.
- D. For fireresistance-rated construction, type and size same as used in fireresistance-rating test.
- E. Clips: Zinc-coated (galvanized) steel; gypsum board manufacturer's standard items.

## **2.5 FINISHING MATERIALS AND LAMINATING ADHESIVE**

- A. ASTM C475 and ASTM C840. Free of antifreeze, vinyl adhesives, preservatives, biocides and other VOC. Adhesive shall contain a maximum VOC content of 50 g/l.

# **PART 3 - EXECUTION**

## **3.0 EXAMINATION**

- A. In areas requiring new work and patching, verify existing finishes shown in the finish schedule and on the plans. Immediately call any discrepancies to the COR's attention. New wall and ceiling finishes shall match the existing finishes, unless otherwise noted.
1. For existing ceiling patching, where ceiling is cut out or portions removed for removal of existing devices or installation of new work, patch the disturbed portion to match the existing ceiling finish.
  2. Freestanding columns in a room shall receive the same finish as the room wall, unless otherwise noted.
  3. Plaster or gypsum wallboard walls in an existing building from which vinyl wall fabric is removed, shall be cleaned of all adhesive and a skim coat of plaster shall be applied to receive the new finish.



### 3.1 GYPSUM BOARD HEIGHTS

- A. Extend all layers of gypsum board from floor to underside of structure overhead unless otherwise noted.

### 3.2 INSTALLING GYPSUM BOARD

- A. Coordinate installation of gypsum board with other trades and related work.
- B. Install gypsum board in accordance with ASTM C840, except as otherwise specified.
- C. Moisture and Mold-Resistant Assemblies: Provide and install moisture and mold-resistant glass mat gypsum wallboard products with moisture-resistant surfaces complying with ASTM C1658/C1658M.
- D. Use gypsum boards in maximum practical lengths to minimize number of end joints.
- E. Bring gypsum board into contact, but do not force into place.
- F. Ceilings:
  - 1. For single-ply construction, use perpendicular application.
  - 2. For two-ply assemblies:
    - a. Use perpendicular application.
    - b. Apply face ply of gypsum board so that joints of face ply do not occur at joints of base ply with joints over framing members.
- G. Walls:
  - 1. When gypsum board is installed parallel to framing members, space fasteners 300 mm (12 inches) on center in field of the board, and 200 mm (8 inches) on center along edges.
  - 2. When gypsum board is installed perpendicular to framing members, space fasteners 300 mm (12 inches) on center in field and along edges.
  - 3. Stagger screws on abutting edges or ends.
  - 4. For single-ply construction, apply gypsum board with long dimension either parallel or perpendicular to framing members as required to minimize number of joints.
  - 5. For two-ply gypsum board assemblies, apply base ply of gypsum board to assure minimum number of joints in face layer. Apply face ply of wallboard to base ply so that joints of face ply do not occur at joints of base ply with joints over framing members.
  - 6. For three-ply gypsum board assemblies, apply plies in same manner as for two-ply assemblies, except that heads of fasteners need only be driven flush with surface for first and second plies. Apply third

- ply of wallboard in same manner as second ply of two-ply assembly, except use fasteners of sufficient length enough to have the same penetration into framing members as required for two-ply assemblies.
7. No offset in exposed face of walls and partitions will be permitted because of single-ply and two-ply or three-ply application requirements.
  8. Control Joints ASTM C840 and as follows:
    - a. Locate at both side jambs of openings if gypsum board is not "yoked". Use one system throughout.
    - b. Not required for wall lengths less than 9000 mm (30 feet).
    - c. Extend control joints the full height of the wall or length of soffit/ceiling membrane.
- H. Acoustical or Sound Rated Partitions, Fire and Smoke Partitions:
1. Cut gypsum board for a space approximately 3 mm to 6 mm (1/8 to 1/4 inch) wide around partition perimeter.
  2. Coordinate for application of caulking or sealants to space prior to taping and finishing.
    - a. Construct walls between patient rooms - and between patient rooms and corridors - using tested wall assemblies with a minimum STC value of 45.
    - b. Construct walls of patient-rooms walls that adjoin a service or public space using tested wall assemblies with a minimum STC value of 50.
    - c. Sound-rated walls or partitions shall be entirely sealed off with closure gaskets and/or acoustical sealant at bottom, top, sides and any other abutment where a sound leak would otherwise occur.
  3. For sound-rated partitions, use sealing compound (ASTM C919) to fill the annular spaces between penetrations such as piping, ducts, conduit, receptacle boxes, and the like and the partition finish material through which the penetrating items protrude to pack and seal all holes and to provide the specified STC value for the wall assembly. Alternatively - for receptacle boxes - seal the openings on the back and sides of the boxes.
- I. Electrical and Telecommunications Boxes:
1. Seal annular spaces between electrical and telecommunications receptacle boxes and gypsum board partitions.
- J. Accessories:

1. Set accessories plumb, level and true to line, neatly mitered at corners and intersections, and securely attach to supporting surfaces as specified.
2. Install in one piece, without the limits of the longest commercially available lengths.
3. Corner Beads:
  - a. Install at all vertical and horizontal external corners and where shown.
  - b. Use screws only. Do not use crimping tool.
4. Edge Trim (Casings Beads):
  - a. At both sides of expansion and control joints unless shown otherwise.
  - b. Where gypsum board terminates against dissimilar materials and at perimeter of openings, except where covered by flanges, casings or permanently built-in equipment.
  - c. Where gypsum board surfaces of non-loadbearing assemblies abut loadbearing members.
  - d. Where shown.

### **3.3 INSTALLING GYPSUM SHEATHING (NOT USED)**

### **3.4 CAVITY SHAFT WALL (NOT USED)**

### **3.5 FINISHING OF GYPSUM BOARD**

- A. Finish joints, edges, corners, and fastener heads in accordance with ASTM C840. Use Level 4 finish for all finished areas open to public view.
- B. Before proceeding with installation of finishing materials, assure the following:
  1. Gypsum board is fastened and held close to framing or furring.
  2. Fastening heads in gypsum board are slightly below surface in dimple formed by driving tool.
- C. Finish joints, fasteners, and all openings, including openings around penetrations, on that part of the gypsum board extending above suspended ceilings to seal surface of non-decorated smoke barrier, fireresistance-rated, and sound-rated // gypsum board construction. After the installation of hanger rods, hanger wires, supports, equipment, conduits, piping and similar work, seal remaining openings and maintain the integrity of the smoke barrier, fireresistance-rated, and sound rated construction. Sanding is not required of non-decorated surfaces.

**3.6 REPAIRS**

- A. After taping and finishing has been completed, and before decoration, repair all damaged and defective work, including non-decorated surfaces.
- B. Patch holes or openings 13 mm (1/2 inch) or less in diameter, or equivalent size, with a setting type finishing compound.
- C. Repair holes or openings over 13 mm (1/2 inch) diameter, or equivalent size, with 16 mm (5/8 inch) thick gypsum board secured in such a manner as to provide solid substrate equivalent to undamaged surface.
- D. Tape and refinish scratched, abraded, or damaged finish surfaces including cracks and joints in non-decorated surface to provide smoke tight construction, fire protection equivalent to the fire rated construction, and STC equivalent to the sound-rated construction.

**3.7 UNACCESSIBLE CEILINGS (NOT USED)**

- - - E N D - - -

**SECTION 09 30 13  
CERAMIC/PORCELAIN TILING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies interior porcelain tile and tile backer board.

**1.2 RELATED WORK:**

- A. Sealing of Joints: Section 07 92 00, JOINT SEALANTS.
- B. Metal and Resilient Edge Strips at Joints with New Resilient Flooring, and Carpeting: Section 09 65 19, RESILIENT TILE FLOORING and Section 09 68 00, CARPETING.

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
1. Wall tile, each color, size, and pattern.
- C. Product Data:
1. Porcelain tile, marked to show each type, size, and shape required.
  2. Chemical-resistant grout (epoxy).
  3. Cementitious backer unit.
  4. Dry-set Portland-cement mortar.
  5. Reinforcing tape.
  6. Patching and leveling compound.
  7. Latex-modified Portland-cement mortar.
  8. Fasteners.
- D. Certification:
1. Master grade certificate, ANSI A137.1.
  2. Manufacturer's certificates indicating that the following materials comply with specification requirements:
    - a. Chemical-resistant grout (epoxy).
    - b. Cementitious backer unit.
    - c. Dry-set Portland-cement mortar.
    - d. Reinforcing tape.
    - e. Latex-modified Portland-cement mortar.
    - f. Patching and leveling compound.
- E. Installer Qualifications:
1. Submit letter stating installer's experience.

**1.4 DELIVERY AND STORAGE:**

- A. Deliver materials in containers with labels legible and intact and grade-seals unbroken.
- B. Store material to prevent damage or contamination.

**1.5 QUALITY ASSURANCE:**

- A. Installers shall be from a company specializing in performing installation of products specified and have a minimum of three (3) years' experience.
- B. Each type and color of tile to be provided from a single source.
- C. Each type and color of mortar and grout to be provided from the same source.

**1.6 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".

**1.7 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in text by basic designation only.
- B. American National Standards Institute (ANSI):
  - A108/A118/A136-14.....Installation of Ceramic Tile
  - A108.01-13.....Subsurfaces and Preparations by Other Trades
  - A108.1B-99 (Reaffirmed 2010) Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar
  - A108.6-10.....Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy
  - A118.1-10.....Dry-Set Cement Mortar
  - A118.3-11.....Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive
  - A118.4-10.....Modified Dry-Set Cement Mortar
  - A118.7-10.....High Performance Cement Grouts for Tile Installation
  - A118.9-10.....Cementitious Backer Units
  - A137.1-13.....American National Standard Specifications for Ceramic Tile
- C. ASTM International (ASTM):

- C109/C109M-13.....Standard Test Method for Compressive Strength  
of Hydraulic Cement Mortars (Using 2 inch. or  
[50-mm] Cube Specimens)
- C348-14.....Standard Test Method for Flexural Strength of  
Hydraulic-Cement Mortars
- C954-15.....Steel Drill Screws for the Application of  
Gypsum Board on Metal Plaster Base to Steel  
Studs from 0.033 in (0.84 mm) to 0.112 in (2.84  
mm) in thickness
- C1002-14.....Steel Self-Piercing Tapping Screws for the  
Application of Panel Products
- C1325-14.....Non-Asbestos Fiber-Mat Reinforced Cementitious  
Backer Units

D. Code of Federal Regulation (CFR):

- 40 CFR 59.....Determination of Volatile Matter Content, Water  
Content, Density Volume Solids, and Weight  
Solids of Surface Coating

E. Tile Council of North America, Inc. (TCNA):

Handbook for Ceramic Tile Installation (2014)

**PART 2 - PRODUCTS**

**2.1 TILE:**

- A. Comply with ANSI A137.1, Standard Grade, except as modified:
1. Inspection procedures listed under the Appendix of ANSI A137.1.
  2. Factory Blending: For tile with color variations, within the ranges selected during sample submittals blend tile in the factory and package so tile units taken from one (1) package show the same range in colors as those taken from other packages and match approved samples.
  3. Factory-Applied Temporary Protective Coating:
    - a. Protect exposed face surfaces (top surface) of tile against adherence of mortar and grout by pre-coating with a continuous film of hot applied petroleum paraffin wax.
    - b. Do not coat unexposed tile surfaces.
    - c. Pre-wax tiles set or grouted with epoxy or set with latex-modified mortars.
- B. Porcelain Paver Tile: Nominal 8 mm (5/16 inch) thick, with cushion edges. Porcelain tile produced by the dust pressed method are to be made of approximately 50% feldspar; the remaining 50% is to be made up

of various high-quality light firing ball clays yielding a tile with a water absorption rate of 0.5% or less and a breaking strength of between 176 to 181 kg (390 to 400 lbs.).

C. Trim Shapes:

1. Conform to applicable requirements of adjoining wall tile.
2. Use trim shapes sizes conforming to size of adjoining field wall tile unless detailed on Construction Documents or specified otherwise.

**2.2 BACKER UNITS:**

A. Cementitious Backer Units:

1. Conform to ASTM C1325; Type A.
2. Use in maximum lengths available to minimize end to end butt joints.

**2.3 JOINT MATERIALS FOR CEMENTITIOUS BACKER UNITS:**

- A. Reinforcing Tape: Vinyl-coated woven glass fiber mesh tape, open weave, 50 mm (2 inches) wide. Tape with pressure-sensitive adhesive backing will not be permitted.
- B. Tape Embedding Material: Latex-modified Portland-cement mortar complying with ANSI A108.01.
- C. Joint material, including reinforcing tape, and tape embedding material, are to be as specifically recommended by the backer unit manufacturer.

**2.4 FASTENERS:**

A. Screws for Cementitious Backer Units.

1. Standard screws for gypsum board are not acceptable.
2. Minimum 11 mm (7/16 inch) diameter head, corrosion-resistance-coated, with washers.
3. ASTM C954 for steel 1 mm (0.033 inch) thick.
4. ASTM C1002 for steel framing less than 0.0329 inch thick.

B. Washers: Galvanized steel, 13 mm (1/2 inch) minimum diameter.

**2.5 SETTING MATERIALS OR BOND COATS:**

A. Conform to TCNA Handbook for Ceramic Tile Installation.

B. Latex-Modified Portland-Cement Mortar: ANSI A118.4.

1. For wall applications, provide non-sagging, latex-modified Portland-cement mortar complying with ANSI A118.4.
2. Prepackaged Dry-Mortar Mix: Factory-prepared mixture of Portland cement; dry, re-dispersible, ethylene-vinyl-acetate additive; and other ingredients to which only water needs to be added at Project site.



- C. Dry-Set Portland Cement Mortar: ANSI A118.1. For wall applications, provide non-sagging, latex-modified Portland-cement mortar complying with ANSI A118.1.

## **2.6 [RESERVED]**

## **2.7 GROUTING MATERIALS:**

- A. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59 (EPA Method 24).
  - 1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 60 and 100 degrees C (140 and 212 degrees F), respectively, and certified by manufacturer for intended use.

## **2.8 PATCHING AND LEVELING COMPOUND:**

- A. Provide a patching and leveling compound with the following minimum physical properties:
  - 1. Compressive strength - 25 MPa (3500 psig) per ASTM C109/C109M.
  - 2. Flexural strength - 7 MPa (1000 psig) per ASTM C348 (28 day value).
  - 3. Tensile strength - 4.1 MPa (600 psi) per ANSI 118.7.
  - 4. Density - 1.9.
- B. Capable of being applied in layers up to 38 mm (1-1/2 inches) thick without fillers and up to 101 mm (4 inches) thick with fillers, being brought to a feather edge, and being trowelled to a smooth finish.
- C. Primers, fillers, and reinforcement as required by manufacturer for application and substrate condition.
- D. Ready for use in 48 hours after application.

## **2.9 MARBLE (NOT USED)**

## **2.10 METAL DIVIDER STRIPS (NOT USED)**

## **2.11 WATER:**

- A. Clean, potable and free from salts and other injurious elements to mortar and grout materials.

## **2.12 CLEANING COMPOUNDS (NOT USED)**

## **2.13 FLOOR MORTAR BED REINFORCING (NOT USED)**

## **2.14 POLYETHYLENE SHEET (NOT USED)**

# **PART 3 - EXECUTION**

## **3.0 EXAMINATION**

- A. In areas requiring new work and patching, verify existing finishes shown in the finish schedule and on the plans. Immediately call any discrepancies to the COR's attention. New floor, base, wainscot, and

wall finishes shall match the existing finishes, unless otherwise noted.

1. Freestanding columns in a room shall receive the same finish as the room wall, unless otherwise noted.
2. Where new finishes are applied to existing, the existing finishes shall be removed and/or the existing surfaces prepared as required to receive new finishes, unless otherwise noted. Where required to accommodate the new finishes, the mechanical, plumbing, and electrical trades shall disconnect and remove their respective devices and items from the existing wall and/or floor and relocate to their final position in the new construction. Such devices shall include but not be limited to electrical switches, panels, outlets, thermostats, grills, plumbing fixtures, medical gas outlets, and the like. The respective trade shall also be responsible for any permanent connections of those items which are relocated.
3. Where wall surfaces are patched to match the existing, the new finish shall be applied to the nearest corner or break in the wall plane, unless otherwise noted.
4. Where existing walls are to receive a new finish, any existing painted items in or on the wall (doors, door frames, electrical panels, and the like) shall be repainted to match or coordinate with the new finish, unless otherwise noted.
5. In areas that have an existing floor finish of resilient floor tile or carpet and are to receive a new ceramic tile floor, the flooring and adhesive shall be removed in preparation for such new hard tile.
6. Plaster walls in an existing building that are to receive ceramic wall tile shall have the plaster removed from existing walls to the height of the new ceramic wall tile in preparation for the new setting bed. Install and prepare cement board in accordance with the manufacturer's written instructions.
7. In rooms scheduled to receive new finishes, existing fixtures, devices, hardware, and accessories shall be temporarily removed as required to allow the new finish to extend under or behind the fixture or accessory and then reset.

### **3.1 ENVIRONMENTAL REQUIREMENTS:**

- A. Maintain ambient temperature of work areas at not less than 16 degrees C (60 degrees F), without interruption, for not less than

24 hours before installation and not less than three (3) days after installation.

- B. Maintain higher temperatures for a longer period of time where required by manufacturer's recommendation and ANSI Specifications for installation.
- C. Do not install tile when the temperature is above 38 degrees C (100 degrees F).
- D. Do not install materials when the temperature of the substrate is below 16 degrees C (60 degrees F).
- E. Do not allow temperature to fall below 10 degrees C (50 degrees F) after third day of completion of tile work.

### **3.2 ALLOWABLE TOLERANCE:**

- A. Variation in Plane of Wall Surfaces:
  - 1. Not more than 3 mm in 2438 mm (1/8 inch in 8 feet) where dry-set or latex-modified Portland-cement mortar is used.

### **3.3 SURFACE PREPARATION:**

- A. Patching and Leveling:
  - 1. Mix and apply patching and leveling compound in accordance with manufacturer's instructions.
  - 2. Fill holes and cracks with patching and leveling compound.
    - a. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
  - 3. Apply leveling coats of material compatible with wall surface and tile setting material to wall surfaces that are out of required plane.

### **3.4 CEMENTITIOUS BACKER UNITS:**

- A. Remove polyethylene wrapping from cementitious backer units and separate to allow for air circulation. Allow moisture content of backer units to dry down to a maximum of 35 percent before applying joint treatment and tile.
- B. Install in accordance with ANSI A118.9 except as specified otherwise.
- C. Install units horizontally or vertically to minimize joints with end joints over framing members. Units with rounded edges; face rounded edge away from studs to form a "V" joint for joint treatment.
- D. Secure cementitious backer units to each framing member with screws spaced not more than 203 mm (8 inches) on center and not closer than 13 mm (1/2 inch) from the edge of the backer unit or as recommended by

backer unit manufacturer. Install screws so that the screw heads are flush with the surface of the backer unit.

E. Do not install joint treatment for seven (7) days after installation of cementitious backer unit.

F. Joint Treatment:

1. Fill horizontal and vertical joints and corners with latex-modified Portland-cement mortar. Apply fiberglass tape over joints and corners and embed with same mortar.

### **3.5 GLASS MAT WATER-RESISTANT BACKING BOARD (NOT USED)**

### **3.6 MARBLE (NOT USED)**

### **3.7 METAL DIVIDER STRIPS (NOT USED)**

### **3.8 CERAMIC TILE - GENERAL:**

A. Comply with ANSI A108/A118/A136 series of tile installation standards applicable to methods of installation and TCNA Installation Guidelines.

B. Setting Beds or Bond Coats:

1. Set wall tile installed over concrete backer board in latex-modified Portland-cement mortar, ANSI A108.1B.
2. Set trim shapes in same material specified for setting adjoining tile.

C. Workmanship:

1. Lay out tile work so that no tile less than one-half full size is used. Make all cuts on the outer edge of the field. Align new tile work scheduled for existing spaces to the existing tile work unless specified otherwise.
2. Set tile firmly in place with finish surfaces in true planes. Align tile flush with adjacent tile unless shown otherwise on Construction Documents.
3. Form intersections and returns accurately.
4. Cut and drill tile neatly without marring surface.
5. Cut edges of tile abutting penetrations, finish, or built-in items:
  - a. Fit tile closely around electrical outlets, piping, fixtures and fittings, so that plates, escutcheons, collars and flanges will overlap cut edge of tile.
  - b. Seal tile joints water tight as specified in Section 07 92 00, JOINT SEALANTS, around electrical outlets, piping fixtures and fittings before cover plates and escutcheons are set in place.
6. Completed work shall be free from hollow-sounding areas and from loose, cracked, or defective tile.

7. Remove and reset tiles that are out-of-plane or misaligned.
8. Walls:
  - a. Cover walls and partitions, including pilasters, furred areas, and freestanding columns from floor to ceiling, or from floor to nominal wainscot heights as indicated in Construction Documents with tile.
  - b. Finish reveals of openings with tile, except where other finish materials are indicated in Construction Documents.
  - c. Finish wall surfaces behind and at sides of casework and equipment, except those units mounted in wall recesses, with same tile as scheduled for room proper.
9. Joints:
  - a. Keep all joints in-line, straight, level, perpendicular, and of even width unless shown otherwise on Construction Documents.
  - b. Make joints in tile, porcelain type; maximum 3 mm (1/8 inch) wide.
10. Back Buttering: For installations indicated below, obtain 100-percent mortar coverage by complying with applicable special requirements for back buttering of tile in referenced ANSI A108/A118/A136 series of tile installation standards:
  - a. Tile installed with chemical-resistant grouts.
  - b. Tile wall installations composed of tiles 203 by 203 mm (8 by 8 inches) or larger.

### **3.9 CERAMIC TILE INSTALLED WITH PORTLAND CEMENT MORTAR (NOT USED)**

### **3.10 PORCELAIN TILE INSTALLED WITH LATEX-MODIFIED PORTLAND CEMENT BONDING MORTAR (NOT USED)**

### **3.11 THIN-SET CERAMIC AND PORCELAIN TILE INSTALLED WITH DRY-SET PORTLAND CEMENT AND LATEX-MODIFIED PORTLAND CEMENT MORTAR:**

A. Installation of Tile: ANSI A108.1B, except as specified otherwise.

### **3.12 THIN-SET CERAMIC AND PORCELAIN TILE INSTALLED WITH ORGANIC ADHESIVE (NOT USED)**

### **3.13 THIN-SET CERAMIC AND PORCELAIN TILE INSTALLED WITH CHEMICAL-RESISTANT BOND COAT (NOT USED)**

### **3.14 CERAMIC AND PORCELAIN TILE INSTALLED WITH ELASTOMERIC BOND COAT (NOT USED)**

### **3.15 GROUTING:**

A. Workmanship:

1. Install and cure grout in accordance with the applicable standard.
2. Epoxy Grout: ANSI A108.6.

3. Water-Cleanable Epoxy Grout: ANSI A118.3.

**3.16 MOVEMENT JOINTS:**

- A. Prepare tile expansion, isolation, construction and contraction joints for installation of sealant. Refer to Section 07 92 00, JOINT SEALANTS.
- B. TCNA details EJ 171-14.

**3.17 CLEANING:**

- A. Thoroughly sponge and wash tile.
- B. Methods and materials used are not permitted to damage or impair appearance of tile surfaces.
- C. Clean tile grouted with epoxy grout as recommended by the manufacturer of the grout and bond coat.

**3.18 PROTECTION:**

- A. Keep traffic off tile floor, until grout and setting material is fully set and cured.
- B. Where traffic over tile floor is unavoidable, cover tile floor with not less than 9 mm (3/8 inch) thick plywood, wood particle board, or hardboard securely taped in place. Do not remove protective cover until time for final inspection. Clean tile of any tape, adhesive and stains.

**3.19 TESTING FINISH FLOOR (NOT USED)**

- - - E N D - - -

**SECTION 09 51 00  
ACOUSTICAL CEILINGS**

**PART 1- GENERAL**

**1.1 DESCRIPTION**

- A. Metal ceiling suspension system for acoustical ceilings.
- B. Acoustical units.
- C. Adhesive application.

**1.2 RELATED WORK (NOT USED)**

**1.3 SUBMITTAL**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
  - 1. Acoustical units, each type, with label indicating conformance to specification requirements, including units specified to match existing.
  - 2. Colored markers for units providing access.
- C. Manufacturer's Literature and Data:
  - 1. Ceiling suspension system, each type, showing complete details of installation, including suspension system specified to match existing.
  - 2. Acoustical units, each type
- D. Manufacturer's Certificates: Acoustical units, each type, in accordance with specification requirements.

**1.4 DEFINITIONS**

- A. Standard definitions as defined in ASTM C634.
- B. Terminology as defined in ASTM E1264.

**1.5 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - A641/A641M-09.....Zinc-coated (Galvanized) Carbon Steel Wire
  - C423-09.....Sound Absorption and Sound Absorption  
Coefficients by the Reverberation Room Method
  - C634-11.....Standard Terminology Relating to Environmental  
Acoustics
  - C635/C635M-13.....Metal Suspension Systems for Acoustical Tile and  
Lay-in Panel Ceilings
  - C636/C636M-13.....Installation of Metal Ceiling Suspension Systems  
for Acoustical Tile and Lay-in Panels

- E84-13.....Surface Burning Characteristics of Building Materials
- E119-12.....Fire Tests of Building Construction and Materials
- E413-10.....Classification for Rating Sound Insulation.
- E580/E580M-11.....Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint
- E1264-08e1.....Classification for Acoustical Ceiling Products
- C. International Organization for Standardization (ISO)
- ISO 14644-1.....Classification of Air Cleanliness

## **PART 2- PRODUCTS**

### **2.1 METAL SUSPENSION SYSTEM**

- A. ASTM C635/C635M, heavy-duty system, except as otherwise specified.
  - 1. Ceiling suspension system members may be fabricated from either of the following unless specified otherwise.
    - a. Galvanized cold-rolled steel, bonderized.
    - b. Extruded aluminum.
    - c. Fireresistant plastic (glass fiber) having a flame spread rating of not more than 25 when tested in accordance with ASTM E84.
  - 2. Use same construction for cross runners as main runners. Use of lighter-duty sections for cross runners is not acceptable.
  - 3. Use aluminum or fireresistant plastic in toilets adjacent to shower areas.
- B. Exposed grid suspension system for support of lay-in panels:
  - 1. Exposed grid width with nominal width of 9/16-inch and not less than 1/4-inch panel bearing surface.
  - 2. Fabricate wall molding and other special molding from the same material with same exposed width and finish as the exposed grid members.
  - 3. On exposed metal surfaces apply baked-on enamel flat texture finish in color to match adjacent acoustical units unless specified otherwise.

### **2.2 PERIMETER SEAL**

- A. Vinyl, polyethylene or polyurethane open cell sponge material having density of 1.3 plus or minus 10 percent, compression set less than 10 percent with pressure sensitive adhesive coating on one side.
- B. Thickness as required to fill voids between back of wall molding and finish wall.
- C. Not less than 9 mm (3/8 inch) wide strip.



**2.3 WIRE**

- A. ASTM A641/A641M.
- B. For wire hangers: Minimum diameter 2.68 mm (0.1055 inch).
- C. For bracing wires: Minimum diameter 3.43 mm (0.1350 inch).

**2.4 ANCHORS AND INSERTS**

- A. Use anchors or inserts to support twice the loads imposed by hangers attached thereto.
- B. Hanger Inserts:
  - 1. Fabricate inserts from steel, zinc-coated (galvanized after fabrication).
  - 2. Nailing type option for wood forms:
    - a. Upper portion designed for anchorage in concrete and positioning lower portion below surface of concrete approximately 25 mm (one inch).
    - b. Lower portion provided with not less than 8 mm (5/16 inch) hole to permit attachment of hangers.
  - 3. Flush ceiling insert type:
    - a. Designed to provide a shell covered opening over a wire loop to permit attachment of hangers and keep concrete out of insert recess.
    - b. Insert opening inside shell approximately 16 mm (5/8 inch) wide by 9 mm (3/8 inch) high over top of wire.
    - c. Wire 5 mm (3/16 inch) diameter with length to provide positive hooked anchorage in concrete.
- C. Clips:
  - 1. Galvanized steel.
  - 2. Designed to clamp to steel beam or bar joists, or secure framing member together.
  - 3. Designed to rigidly secure framing members together.
  - 4. Designed to sustain twice the loads imposed by hangers or items supported.
- D. Tile Splines: ASTM C635/C635M.

**2.5 CARRYING CHANNELS FOR SECONDARY FRAMING**

- A. Fabricate from cold-rolled or hot-rolled steel, black asphaltic paint finish, free of rust.
- B. Weighing not less than the following, per 300 m (per thousand linear feet):

Size mm	Size Inches	Cold-rolled		Hot-rolled	
		Kg	Pound	Kg	Pound
38	1 1/2	215.4	475	508	1120
50	2	267.6	590	571.5	1260

## 2.6 ADHESIVE

- A. ASTM D1779, having flame spread index of 25 or less when tested in accordance with ASTM E84.
- B. Developing minimum strength of 7 kg/m<sup>2</sup> (one psi) of contact surface 48 hours after installation in temperature of 21 °C (70 °F).

## 2.7 ACOUSTICAL UNITS

- A. General:
  1. Ceiling Tile shall meet minimum 37% bio-based content in accordance with USDA BioPreferred Product requirements.
  2. ASTM E1264, weighing 3.6 kg/m<sup>2</sup> (3/4 psf) minimum for mineral fiber panels.
  3. Class A Flame Spread: ASTM 84
  4. Minimum NRC (Noise Reduction Coefficient): 0.55 unless specified otherwise: ASTM C423.
  5. Minimum CAC (Ceiling Attenuation Class): 35 unless specified otherwise: ASTM E413.
  6. Manufacturers standard finish, minimum Light Reflectance (LR) coefficient of 0.75 on the exposed surfaces, except as specified otherwise.
  7. Lay-in panels: Sizes as shown, with square edges.
- B. Special faced acoustical tile units AT(SP) shall be used for surgery/clean areas, kitchens, SPD and wet areas as per referenced in PG-18-14, Room Finishes, Door, & Hardware Schedule. AT(SP) Special faced acoustical tile units shall provide anti-microbial coated surfaces suitable for use in Class 5 Clean Rooms per ISO 14644-1. Special faced acoustical tile units shall meet all general requirements stated in this specification.
- C. Type III Units - Mineral base with water-based painted finish less than 10 g/l VOC, Form 2 - Water felted, minimum 16 mm (5/8 inch) thick. Mineral base to contain minimum 65 percent recycled content.
- D. Type IV Units - Mineral base with membrane-faced overlay, Form 2 - Water felted, minimum 16 mm (5/8 inch) thick. Apply over the paint coat on the face of the unit a poly (vinyl) chloride overspray having a flame spread index of 25 or less when tested in accordance with ASTM E84.
- E. Type III-A Units - Mineral base with painted finish.

1. Form 1, modular, cast or molded.
  2. Minimum NRC of 0.75.
  3. Minimum thickness of 19 mm (3/4 inch) and weight of 4.9 Kg/sq m (one pound per square foot).
- F. Type XX-B Units - Combination mineral base and glass fiber with fabric finish.
1. Back half of panel: Perforated water felted mineral fiber.
  2. Face half of panel: Glass fiber with glass cloth face.
  3. Minimum NRC of 0.75.
  4. Minimum thickness of 28 mm (1 1/8 inches).

## 2.9 ACCESS IDENTIFICATION

- A. Markers:
1. Use colored markers with pressure sensitive adhesive on one side.
  2. Make colored markers of paper or plastic, 6 to 9 mm (1/4 to 3/8 inch) in diameter.
- B. Use markers of the same diameter throughout building.
- C. Color Code: Use following color markers for service identification:
- |             |  |
|-------------|--|
| Color.....  | Service                                  |
| Red.....    | Sprinkler System: Valves and Controls    |
| Green.....  | Domestic Water: Valves and Controls      |
| Yellow..... | Chilled Water and Heating Water          |
| Orange..... | Ductwork: Fire Dampers                   |
| Blue.....   | Ductwork: Dampers and Controls           |
| Black.....  | Gas: Laboratory, Medical, Air and Vacuum |

## PART 3 EXECUTION

### 3.0 EXAMINATION

- A. In areas requiring new work and patching, verify existing finishes shown in the finish schedule and on the plans. Immediately call any discrepancies to the COR's attention. New ceiling finishes shall match the existing finishes, unless otherwise noted.
1. For existing ceiling patching, where ceiling is cut out or portions removed for removal of existing devices or installation of new work, the disturbed portion shall be patched to match the existing ceiling finish.
  2. Where required to accommodate the new finishes, the mechanical, plumbing, and electrical trades shall disconnect and remove their respective devices and items from the existing ceiling and relocate to their final position in the new construction. Such devices shall include but not be limited to diffusers, grilles, and the like. The respective trade shall also be responsible for any permanent connections of those items which are relocated.

### 3.1 CEILING TREATMENT

- A. Treatment of ceilings shall include sides and soffits of ceiling beams, furred work 600 mm (24 inches) wide and over, and vertical surfaces at changes in ceiling heights unless otherwise shown. Install acoustic tiles after wet finishes have been installed and solvents have cured.
- B. Lay out acoustical units symmetrically about center lines of each room or space unless shown otherwise on reflected ceiling plan.
- C. Moldings:
  - 1. Install metal wall molding at perimeter of room, column, or edge at vertical surfaces.
  - 2. Install special shaped molding at changes in ceiling heights and at other breaks in ceiling construction to support acoustical units and to conceal their edges.
- D. Perimeter Seal:
  - 1. Install perimeter seal between vertical leg of wall molding and finish wall, partition, and other vertical surfaces.
  - 2. Install perimeter seal to finish flush with exposed faces of horizontal legs of wall molding.
- E. Existing ceiling:
  - 1. Where extension of existing ceilings occur, match existing.
  - 2. Where acoustical units are salvaged and reinstalled or joined, use salvaged units within a space. Do not mix new and salvaged units within a space which results in contrast between old and new acoustic units.
  - 3. Comply with specifications for new acoustical units for new units required to match appearance of existing units.
- F. Fireresistance-Rated System:
  - 1. Total assembly, consisting of the ceiling suspension system, acoustical units, penetrations, structural components and floor or roof construction above, shall have a fire rating based on tests conducted in conformance with ASTM E119.
  - 2. Provide concealed fire protection around penetrations in ceilings for electric and mechanical work, and other penetrations as required to maintain the integrity of the fireresistance-rated assembly.
  - 3. Install fireresistance-rated ceiling systems to conform to tested assembly.

### 3.2 CEILING SUSPENSION SYSTEM INSTALLATION

- A. General:
  - 1. Install metal suspension system for acoustical tile and lay-in panels in accordance with ASTM C636/C636M, except as specified otherwise.

2. Use direct or indirect hung suspension system or combination thereof as defined in ASTM C635/C635M.
3. Support a maximum area of 1.48 m<sup>2</sup> (16 sf) of ceiling per hanger.
4. Prevent deflection in excess of 1/360 of span of cross runner and main runner.
5. Provide extra hangers, minimum of one hanger at each corner of each item of mechanical, electrical and miscellaneous equipment supported by ceiling suspension system not having separate support or hangers.
6. Provide not less than 100 mm (4 inch) clearance from the exposed face of the acoustical units to the underside of ducts, pipe, conduit, secondary suspension channels, concrete beams or joists; and steel beam or bar joist unless furred system is shown,
7. Use main runners not less than 1200 mm (48 inches) in length.
8. Install hanger wires vertically. Angled wires are not acceptable except for seismic restraint bracing wires.

B. Anchorage to Structure:

1. Concrete:

- aa. Use eye pins or threaded studs with screw-on eyes in existing or already placed concrete structures to support hanger and bracing wire. Install in sides of concrete beams or joists at mid height.

2. Steel:

- a. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels for attachment of hanger wires.
  - (1) Size and space carrying channels to insure that the maximum deflection specified will not be exceeded.
  - (2) Attach hangers to steel carrying channels, spaced four feet on center, unless area supported or deflection exceeds the amount specified.
- b. Attach carrying channels to the bottom flange of steel beams spaced not 1200 mm (4 feet) on center before fire proofing is installed. Weld or use steel clips to attach to beam to develop full strength of carrying channel.
- c. Attach hangers to bottom chord of bar joists or to carrying channels installed between the bar joists when hanger spacing prevents anchorage to joist. Rest carrying channels on top of the bottom chord of the bar joists, and securely wire tie or clip to joist.

B. Direct Hung Suspension System:

1. As illustrated in ASTM C635/C635M.

2. Support main runners by hanger wires attached directly to the structure overhead.
3. Maximum spacing of hangers, 1200 mm (4 feet) on centers unless interference occurs by mechanical systems. Use indirect hung suspension system where not possible to maintain hanger spacing.

C. Indirect Hung Suspension System:

1. As illustrated in ASTM C635/C635M.
2. Space carrying channels for indirect hung suspension system not more than 1200 mm (4 feet) on center. Space hangers for carrying channels not more than 2400 mm (8 feet) on center or for carrying channels less than 1200 mm (4 feet) on center so as to insure that specified requirements are not exceeded.
3. Support main runners by specially designed clips attached to carrying channels.

D. Seismic Ceiling Bracing System:

1. Construct system in accordance with ASTM E580/E580M.
2. Connect bracing wires to structure above as specified for anchorage to structure and to main runner or carrying channels of suspended ceiling at bottom.

### 3.3 ACOUSTICAL UNIT INSTALLATION

- A. Cut acoustic units for perimeter borders and penetrations to fit tight against penetration for joint not concealed by molding.
- B. Install lay-in acoustic panels in exposed grid with not less than 6 mm (1/4 inch) bearing at edges on supports.
  1. Install tile to lay level and in full contact with exposed grid.
  2. Replace cracked, broken, stained, dirty, or tile not cut for minimum bearing.
- C. Markers:
  1. Install markers of color code specified to identify the various concealed piping, mechanical, and plumbing systems.
  2. Attach colored markers to exposed grid on opposite sides of the units providing access.
  3. Attach marker on exposed ceiling surface of upward-access unit.

### 3.5 CLEAN-UP AND COMPLETION

- A. Replace damaged, discolored, dirty, cracked and broken acoustical units.
- B. Leave finished work free from defects.

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**SECTION 09 65 13**  
**RESILIENT BASE AND ACCESSORIES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies the installation of vinyl or rubber base.

**1.2 RELATED WORK**

- A. Color and texture: Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Integral base with sheet flooring: Section 09 65 16, RESILIENT SHEET FLOORING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
  - 1. Description of each product.
  - 2. Base manufacturer's recommendations for adhesives.
  - 3. Application and installation instructions.
- C. Samples:
  - 1. Base: 150 mm (6 inches) long, each type and color.
  - 2. Adhesive: Literature indicating each type.

**1.4 DELIVERY**

- A. Deliver materials to the Project site in original sealed packages or containers, clearly marked with the manufacturer's name or brand, type and color, production run number and date of manufacture.
- B. Materials from containers which have been distorted, damaged, or opened prior to installation will be rejected.

**1.5 STORAGE**

- A. Store materials in weather tight and dry storage facility.
- B. Protect material from damage by handling and construction operations before, during, and after installation.

**1.6 APPLICABLE PUBLICATIONS**

- A. The publication listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - F1861-08.....Resilient Wall Base

**PART 2 - PRODUCTS**

**2.1 GENERAL**

- A. Use only products by the same manufacturer and from the same production run.

**2.2 RESILIENT BASE**

- A. ASTM F1861, 3 mm (1/8 inch) thick, 100 mm (4 inches) high, Thermoplastics, Group 2-layered. Style B-cove.
- B. Where carpet occurs, use Style A-straight.
- C. Where indicated or scheduled, use sculptured wall base with profile that replicates the look of finely milled wood.
  - 1. Classification: ASTM F1861, Group 1-solid, Style D-sculptured.

**2.3 RESILIENT TREADS (NOT USED)****2.4 SHEET RUBBER FLOORING (NOT USED)****2.5 PRIMER (FOR CONCRETE FLOORS)**

- A. As recommended by the adhesive and tile manufacturer.

**2.6 LEVELING COMPOUND (FOR CONCRETE FLOORS)**

- A. Provide products with latex or polyvinyl acetate resins in the mix.

**2.7 ADHESIVES**

- A. Use products recommended by the material manufacturer for the conditions of use.
- B. Use low-VOC adhesive during installation. Water based adhesive with low VOC is preferred over solvent based adhesive.

**PART 3 - EXECUTION****3.0 EXAMINATION**

- A. In areas requiring new work and patching, verify existing finishes shown in the finish schedule and on the plans. Immediately call any discrepancies to the COR's attention. New base finishes shall match the existing finishes, unless otherwise noted.
  - 1. Freestanding columns in a room shall receive the same finish as the room wall, unless otherwise noted.
  - 2. Where new finishes are applied to existing, the existing finishes shall be removed and/or the existing surfaces prepared as required to receive new finishes, unless otherwise noted.
  - 3. Where wall surfaces are patched to match the existing, the new finish shall be applied to the nearest corner or break in the wall plane, unless otherwise noted.
  - 4. In areas that have an existing base finish of quarry tile or ceramic tile and are noted to receive a resilient base finish, the ceramic/quarry tile shall be removed and the area shall be leveled in preparation for the new finish.

**3.1 PROJECT CONDITIONS**

- A. Maintain temperature of materials above 21° C (70 °F), for 48 hours before installation.



- B. Maintain temperature of rooms where work occurs, between 21° C and 27° C (70°F and 80°F) for at least 48 hours, before, during, and after installation.
- C. Do not install materials until building is permanently enclosed and wet construction is complete, dry, and cured.

### **3.2 INSTALLATION REQUIREMENTS**

- A. The respective manufacturer's instructions for application and installation will be considered for use when approved by the COR.
- B. Submit proposed installation deviation from this specification to the COR indicating the differences in the method of installation.
- C. The COR reserves the right to have test portions of material installation removed to check for non-uniform adhesion and spotty adhesive coverage.

### **3.3 PREPARATION**

- A. Examine surfaces on which material is to be installed.
- B. Fill cracks, pits, and dents with leveling compound.
- C. Level to 3 mm (1/8 inch) maximum variations.
- D. Do not use adhesive for leveling or filling.
- E. Grind, sand, or cut away protrusions; grind high spots.
- F. Clean substrate area of oil, grease, dust, paint, and deleterious substances.
- G. Substrate area dry and cured. Perform manufacturer's recommended bond and moisture test.
- H. Preparation of existing installation:
  - 1. Remove existing base including adhesive.
  - 2. Do not use solvents to remove adhesives.
  - 3. Prepare substrate as specified.

### **3.4 BASE INSTALLATION**

- A. Location:
  - 1. Unless otherwise specified or shown, where base is scheduled, install base over toe space of base of casework, lockers, cabinets, and where other equipment occurs.
  - 2. Extend base scheduled for room into adjacent closet, alcoves, and around columns.
- B. Application:
  - 1. Apply adhesive uniformly with no bare spots.
    - a. Sculptured Wall Base: Tightly adhere to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
  - 2. Set base with joints aligned and butted to touch for entire height.

3. Before starting installation, layout base material to provide the minimum number of joints with no strip less than 600 mm (24 inches) length.

- a. Short pieces to save material will not be permitted.
- b. Locate joints as remote from corners as the material lengths or the wall configuration will permit.

C. Conventional Wall Base: Form corners and end stops as follows:

1. Score back of outside corner.

a. Where the length of base on one or both sides of an outside corner are less than 4 inches, or where two corners are within 8 inches of each other, take extraordinary measures to ensure that the lengths of wall base on either sides do not de-laminate from the substrate. These measures can include -- but are not limited to -- one or more of the following:

- i. Folding the wall base at the corner to 360 degrees and using a suitably sized flat-faced weight to keep the flat portions in that position for an appropriate length of time.
- ii. Applying a primer recommended by the adhesive manufacturer to the entire area of the substrate that will receive the wall base.
- iii. Using an adhesive with the highest bond strength available.
- iv. Applying adhesive to the entire back surface of the wall base.
- v. Securing a flat-faced object against the flat portions of the applied wall base for an appropriate length of time.

2. Score face of inside corner and notch cove.

D. Sculptured Wall Base: Provide field-formed corners.

- 1. Outside Corners: Use straight pieces of maximum lengths possible and miter corners to fit.
- 2. Inside Corners: Butt one piece to corner then scribe next piece to fit.

E. Roll base for complete adhesion.

### **3.5 STAIR TREAD INSTALLATION (NOT USED)**

### **3.6 SHEET RUBBER INSTALLATION (NOT USED)**

### **3.7 CLEANING AND PROTECTION**

A. Clean all exposed surfaces of base and adjoining areas of adhesive spatter before it sets.

B. Clean and polish materials in the following order:

- 1. After two weeks, scrub resilient base with a minimum amount of water and a mild detergent. Leave surfaces clean and free of detergent residue. Polish resilient base to a gloss finish.

2. Do not polish tread and sheet rubber materials.
- C. When construction traffic is anticipated, cover tread materials with reinforced kraft paper and plywood or hardboard properly secured and maintained until removal is directed by the COR.
- D. Where protective materials are removed and immediately prior to acceptance, replace damaged materials and re-clean resilient materials. Damaged materials are defined as having cuts, gouges, scrapes or tears and not fully adhered.

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**SECTION 09 65 16  
RESILIENT SHEET FLOORING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies the installation of sheet flooring without backing and with integral cove base.
- B. Installation of sheet flooring including following:
  - 1. Heat-welded seams.
  - 2. Integral Cove Base: Installed at intersection of floor and vertical surfaces.

**1.2 RELATED WORK**

- A. Resilient base over base of lockers, equipment and casework: Section 09 65 13, RESILIENT BASE AND ACCESSORIES.

**1.3 QUALITY CONTROL-QUALIFICATIONS:**

- A. The Contracting Officer shall approve products or service of proposed manufacturer, suppliers, and installers, and the Contractor shall submit certification that:
  - 1. Heat-welded seaming is manufacturer's prescribed method of installation.
  - 2. Installer is approved by manufacturer of materials and has technical qualifications, experience, trained personnel, and facilities to install specified items.
  - 3. Manufacturer's product submitted has been in satisfactory operation, on three installations similar and equivalent in size to this Project for three years. Submit list of installations.
- B. The sheet vinyl floor coverings shall meet fire performance characteristics as determined by testing products, per ASTM test method, indicated below by Underwriters Laboratories, Inc. (UL) or another recognized testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Critical Radiant Flux: 0.45 watts per sq. cm or more, Class I, per ASTM E648.
  - 2. Smoke Density: Less than 450 per ASTM E662.
- C. The floor covering manufacturer shall certify that products supplied for installation comply with local regulations controlling use of volatile organic compounds (VOC's).

**1.4 SUBMITTALS**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, submit following:
- B. Manufacturer's Literature and Data:

1. Description of resilient material and accessories to be provided.
2. Resilient material manufacturer's recommendations for adhesives, weld rods, sealants, and underlayment.
3. Application and installation instructions.

C. Samples:

1. Sheet material, 38 mm by 300 mm (1-1/2 inch by 12 inch), of each color and pattern with a welded seam using proposed welding rod.
2. Cap strip and fillet strip, 300 mm (12 inches) for integral base.
3. Shop Drawings and Certificates: Layout of joints showing patterns where joints are expressed, and type and location of obscure type joints. Indicate orientation of directional patterns.
4. Certificates: Quality Control Certificate Submittals and lists specified in paragraph, QUALIFICATIONS.
5. Edge strips: 150 mm (6 inches) long each type.
6. Adhesive, Underlayment, and Primer: Pint container, each type.

#### **1.5 PROJECT CONDITIONS**

- A. Maintain temperature of floor materials and room, where work occurs, above 18 °C (65 °F) and below 38 °C (100 °F) for 48 hours before, during, and for 48 hours after installation. After above period, room temperature shall not fall below 13 °C (55 °F).
- B. Construction in or near areas to receive flooring work shall be complete, dry, and cured. Do not install resilient flooring over slabs until they have been cured and are sufficiently dry to achieve a bond with adhesive. Follow flooring manufacturer's recommendations for bond and moisture testing.
- C. Schedule construction so that floor receives no construction traffic when completed.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Deliver materials to Project site in original sealed packages or containers; labeled for identification with manufacturer's name and brand.
- B. Deliver sheet flooring in full-width roll, completely enclosed in factory wrap, clearly marked with the manufacturer's number, type and color, production run number, and manufacture date.
- C. Store materials in weathertight and dry storage facility. Protect from damage due to handling, weather, and construction operations before, during, and after installation. Store sheet flooring on end with ambient temperatures maintained as recommended by manufacturer.
- D. Store sheet flooring on end.

- E. Move sheet vinyl floor coverings and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

#### **1.7 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American Society for Testing Materials (ASTM):
  - E648-10.....Critical Radiant Flux of Floor-Covering Systems Using a Radiant Energy Source.
  - E662-12.....Specific Optical Density of Smoke Generated by Solid Materials.
  - F710-08.....Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring.
  - F1869-10.....Moisture Vapor Emission Rate of Concrete Subfloor using Anhydrous Calcium Chloride
  - F1913-04(2010).....Sheet Vinyl Flooring without Backing
  - F2170-09.....Determining Relative Humidity in Concrete Floor Slabs using In-situ Probes
- C. Resilient Floor Covering Institute (RFCI):
  - Recommended Work Practices for Removal of Resilient Floor Coverings.

#### **1.8 SCHEDULING**

- A. Interior finish work such as drywall finishing, ceiling work, and painting work shall be complete and dry before installation. Mechanical, electrical, and other work above ceiling line shall be completed. Heating, ventilating, and air-conditioning systems shall be installed and operating in order to maintain temperature and humidity requirements.

#### **1.9 WARRANTY:**

- A. Submit written warranty, in accordance with FAR clause 52.246-21, Warranty of Construction requirements except that warranty period shall be extended to include two (2) years.

### **PART 2 - PRODUCTS**

#### **2.1 SHEET VINYL FLOOR COVERINGS**

- A. Sheet Vinyl Floor Coverings: Smooth face, minimum thickness nominal 2 mm (0.08 inch). Sheet flooring shall conform to ASTM F1913.
- B. Size: Provide maximum size sheet vinyl material produced by manufacturer to provide minimum number of joints. Minimum size width acceptable - 1200 mm (48 inches).

- C. Each color and pattern of sheet flooring shall be of same production run.

## **2.2 WELDING ROD:**

- A. Product of floor covering manufacturer in color shall match field color of sheet vinyl covering.

## **2.3 APPLICATION MATERIALS AND ACCESSORIES**

- A. Floor and Base Adhesive: Type recommended by sheet flooring material manufacturer for conditions of use.
- B. Mastic Underlayment (for concrete floors): Provide products with latex or polyvinyl acetate resins in mix. Condition to be corrected shall determine type of underlayment selected for use.
- C. Base Accessories:
  1. Fillet Strip: 19 mm (3/4 inch) radius fillet strip compatible with resilient sheet material.
  2. Cap Strip: Extruded flanged zero edge vinyl reducer strip approximately 25 mm (one inch) exposed height with 13 mm (1/2 inch) flange.

## **2.4 SHEET FLOORING (NOT USED)**

## **2.5 ADHESIVES (NOT USED)**

## **2.6 BASE CAP STRIP AND COVE STRIP (NOT USED)**

## **2.7 LEVELING COMPOUND (FOR CONCRETE FLOORS) (NOT USED)**

## **2.8 PRIMER (FOR CONCRETE SUBFLOORS)**

- A. As recommended by the adhesive or sheet flooring manufacturer.

## **2.9 EDGE STRIPS**

- A. Extruded aluminum, mill finish, mechanically cleaned.
- B. 28 mm (1-1/8 inch) wide, 6 mm (1/4 inch) thick, bevel one edge to 3 mm (1/8 inch) thick.
- C. Drill and counter sink edge strips for flat head screws. Space holes near ends and approximately 225 mm (9 inches) on center in between.

## **2.10 SEALANT**

- A. As specified in Section 07 92 00, JOINT SEALANTS.
- B. Compatible with sheet flooring.

## **PART 3 - EXECUTION**

### **3.1 PROJECT CONDITIONS**

- A. Maintain temperature of sheet flooring above 36 °C (65 °F), for 48 hours before installation.
- B. Maintain temperature of rooms where sheet flooring work occurs above 36 °C (65 °F), for 48 hours, before installation and during installation.



- C. After installation, maintain temperature at or above 36 °C (65 °F.)
- D. Wet construction in or near areas to receive sheet flooring is complete, dry, and cured.

### **3.2 SUBFLOOR PREPARATION**

- A. Concrete Subfloors: Verify that concrete slabs comply with ASTM F710.
  - 1. Installer shall examine surfaces on which resilient sheet flooring is to be installed, and shall advise Contractor, in writing, of areas which are unacceptable for installation of flooring material. Installer shall advise Contractor which methods are to be used to correct conditions that will impair proper installation. Installation shall not proceed until unsatisfactory conditions have been corrected.
  - 2. Slab substrates dry, free of curing compounds, sealers, hardeners, and other materials which would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by Resilient Floor Covering Institute recommendations in manual RFCI-MRP.
- B. Broom- or vacuum-clean substrates to be covered by sheet vinyl floor coverings immediately before installation. Following cleaning, examine substrates to determine if there is visually any evidence of moisture, alkaline salts, carbonation, or dust.
- C. Primer: If recommended by flooring manufacturer, prior to application of adhesive, apply concrete slab primer in accordance with manufacturer's directions.
- D. Correct conditions which will impair proper installation, including trowel marks, pits, dents, protrusions, cracks, or joints.
- E. Fill cracks, joints, depressions, and other irregularities in concrete with leveling compound.
  - 1. Do not use adhesive for filling or leveling purposes.
  - 2. Do not use leveling compound to correct imperfections which can be corrected by spot grinding.
  - 3. Trowel to smooth surface free of trowel marks, pits, dents, protrusions, cracks, or joint lines.
- F. Clean floor of oil, paint, dust and deleterious substances. Leave floor dry and cured, free of residue from existing curing or cleaning agents.
- G. Moisture Testing: Perform moisture and pH test as recommended by the flooring and adhesive manufacturers. Perform test locations starting on the deepest part of the concrete structure. Proceed with installation only after concrete substrates meet or exceed the manufacturer's

requirements. In the absence of specific guidance from the flooring or adhesive manufacturer, the following requirements shall be met:

1. Perform moisture vapor emission tests in accordance with ASTM F1869. Proceed with installation only after substrates have a maximum moisture-vapor-emission rate of 1.36 kg of water/92.9 sq. m (3lb of water/1000 sq. ft.) in 24 hours.
  2. Perform concrete internal relative humidity testing using in-situ probes in accordance with ASTM F2170. Proceed with installation only after concrete reaches maximum 75-percent relative humidity level measurement.
- H. Preparation shall include the removal of existing resilient floor and existing adhesive. Do not use solvents to remove adhesives.
- I. Remove existing resilient flooring and adhesive completely in accordance with Resilient Floor Covering Institute recommendations in manual RFCI-WP. Solvents shall not be used.

### 3.3 INSTALLATION OF FLOORING

- A. Install work in strict compliance with manufacturer's instructions and approved layout drawings.
- B. Maintain uniformity of sheet vinyl floor covering direction and avoid cross seams.
- C. Arrange for a minimum number of seams and place them in inconspicuous and low-traffic areas, but in no case less than 150 mm (6 inches) away from parallel joints in flooring substrates.
- D. Match edges of resilient floor coverings for color shading and pattern at seams.
- E. Where resilient sheet flooring abuts other flooring material floors shall finish level.
- F. Extend sheet vinyl floor coverings into toe spaces, door reveals, closets, and similar openings.
- G. Inform the Resident Engineer of conflicts between this Section and the manufacturer's instructions or recommendations for auxiliary materials, or installation methods, before proceeding.
- H. Install sheet in full coverage adhesives.
  1. Air pockets or loose edges will not be accepted.
  2. Trim sheet materials to touch in the length of intersection at pipes and vertical projections; seal joints at pipe with waterproof cement or sealant.
- I. Keep joints to a minimum; avoid small filler pieces or strips.
- J. Follow manufacturer's recommendations for seams at butt joints. Do not leave any open joints that would be readily visible from a standing position.

K. Follow manufacturer's recommendations regarding pattern match, if applicable.

L. Installation of Edge Strips:

1. Locate edge strips under centerlines of doors unless otherwise indicated.
2. Set aluminum strips in adhesive, anchor with lead anchors and stainless-steel Phillips screws.

M. Integral Cove Base Installation:

1. Set preformed fillet strip to receive base.
2. Install the base with adhesive; terminate exposed edge with the cap strip.
3. Form internal and external corners to the geometric shape generated by the cove at either straight or radius corners.
4. Solvent-weld joints as specified for the flooring. Seal cap strip to wall with an adhesive type sealant.
5. Unless otherwise specified or shown where sheet flooring is scheduled, provide integral base at intersection of floor and vertical surfaces. Provide sheet flooring and base scheduled for room on floors and walls under and behind areas where casework and other equipment occurs, except where mounted in wall recesses.

#### **3.4 INSTALLATION OF INTEGRAL COVED BASE (NOT USED)**

#### **3.5 WELDING**

- A. Heat-weld all joints of flooring and base using equipment and procedures recommended by flooring manufacturer.
- B. Welding shall consist of routing joint, inserting a welding rod into routed space, and terminally fusing into a homogeneous joint.
- C. Upon completion of welding, surface across joint shall finish flush, free from voids, and recessed or raised areas.
- D. Fusion of Material: Joint shall be fused a minimum of 65 percent through thickness of material, and after welding shall meet specified characteristics for flooring.

#### **3.6 CLEANING**

- A. Clean small adhesive marks during application of sheet flooring and base before adhesive sets; excessive adhesive smearing will not be accepted.
- B. Remove visible adhesive and other surface blemishes using methods and cleaner recommended by floor covering manufacturers.
- C. Clean and polish materials per flooring manufacturer's written recommendations.
- D. Vacuum floor thoroughly.

- E. Do not wash floor until after period recommended by floor covering manufacturer and then prepare in accordance with manufacturer's recommendations.
- F. Upon completion, Resident Engineer will inspect floor and base to ascertain that work was done in accordance with manufacturer's printed instructions.
- G. Perform initial maintenance according to flooring manufacturer's written recommendations.

**3.7 PROTECTION:**

- A. Protect installed flooring as recommended by flooring manufacturer against damage from rolling loads, other trades, or placement of fixtures and furnishings.
- B. Keep traffic off sheet flooring for 24 hours after installation.
- C. Where construction traffic is anticipated, cover sheet flooring with reinforced kraft paper properly secured and maintained until removal is authorized by the Resident Engineer.
- D. Where protective materials are removed and immediately prior to acceptance, repair any damage, re-clean sheet flooring, lightly re-apply polish, and buff floor.

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**SECTION 09 65 19  
RESILIENT TILE FLOORING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies the installation of luxury vinyl tile and accessories required for a complete installation.

**1.2 RELATED WORK:**

- A. Resilient Base: Section 09 65 13, RESILIENT BASE AND ACCESSORIES.
- B. Subfloor Testing and Preparation: Section 09 05 16, SUBSURFACE PREPARATION FOR FLOOR FINISHES.

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
  - 1. Description of each product.
  - 2. Resilient material manufacturer's recommendations for adhesives, underlayment, and primers.
  - 3. Application, installation, and maintenance instructions.
- C. Samples:
  - 1. Tile: Each type, color, thickness, and finish.
  - 2. Edge Strips: Each type, color, thickness, and finish.
  - 3. Feature Strips: Each type, color, thickness, and finish.
- D. Shop Drawings:
  - 1. Layout of patterns as shown on the construction documents.
  - 2. Edge strip locations showing types and detail cross sections.
- E. Test Reports:
  - 1. Abrasion Resistance: Depth of wear for each tile type and color and volume loss of tile, certified by independent laboratory. Tested per ASTM F510/F510M.
  - 2. Moisture and pH test results as per Section 09 05 16, SUBSURFACE PREPARATION FOR FLOOR FINISHES.

**1.4 DELIVERY:**

- A. Deliver materials to the Project site in original sealed packages or containers, clearly marked with the manufacturer's name or brand, type and color, production run number, and date of manufacture.
- B. Materials from containers which have been distorted, damaged, or opened prior to installation are not acceptable.

**1.5 STORAGE:**

- A. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives, and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

**1.6 QUALITY ASSURANCE:**

- A. Installer Qualifications: A company specializing in installation with minimum three (3) years' experience and employs experienced flooring installers who have retained, and currently hold, an INSTALL Certification, or a certification from a comparable certification program.
  - 1. Installers to be certified by INSTALL or a comparable certification program with the following minimum criteria:
    - a. US Department of Labor approved four (4) year apprenticeship program, 160 hours a year.
    - b. Career long training.
    - c. Manufacturer endorsed training.
    - d. Fundamental journeyman skills certification.
- B. Furnish product type materials from the same production run.

**1.7 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".

**1.8 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. ASTM International (ASTM):
  - D2047-11.....Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
  - D2240-05(R2010).....Test Method for Rubber Property—Durometer Hardness
  - D4078-02(R2008).....Water Emulsion Floor Finish
  - E648-14c.....Critical Radiant Flux of Floor Covering Systems Using a Radiant Energy Source

E662-14.....	Specific Optical Density of Smoke Generated by Solid Materials
E1155/E1155M-14.....	Determining Floor Flatness and Floor Levelness Numbers
F510/F510M-14.....	Resistance to Abrasion of Resilient Floor Coverings Using an Abrader with a Grit Feed Method
F710-11.....	Preparing Concrete Floors to Receive Resilient Flooring
F925-13.....	Test Method for Resistance to Chemicals of Resilient Flooring
F1700-13a.....	Solid Vinyl Floor Tile
F1869-11.....	Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
F2170-11.....	Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in Situ Probes

C. International Standards and Training Alliance (INSTALL):

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS:**

- A. Provide adhesives, underlayment, and primers recommended by resilient floor material manufacturer.
- B. Critical Radiant Flux: 0.45 watts per sq. cm or more, Class I, per ASTM E648.
- C. Smoke Density: Less than 450 per ASTM E662.
- D. Slip Resistance - Not less than 0.5 when tested with ASTM D2047.

### **2.2 RUBBER TILE (NOT USED)**

### **2.3 LINOLEUM TILE (NOT USED)**

### **2.4 VINYL COMPOSITION TILE (NOT USED)**

### **2.5 SOLID VINYL-TILE (NOT USED)**

### **2.6 LUXURY VINYL TILE:**

- A. ASTM F1700, Class III, Printed Film Vinyl Tile, Type B (Embossed).
- B. Thicknesses: 1. Rectangular Tile: 0.098 inch (2.5mm).  
2. Square Tile: 0.125 inch (3 mm).
- C. Sizes: See Finish Schedule on the Drawings.

### **2.7 ADHESIVES:**

- A. Provide water-resistant type adhesive for flooring, base, and accessories as recommended by the manufacturer to suit substrate

conditions. Submit manufacturer's descriptive data, documentation stating physical characteristics, and mildew and germicidal characteristics.

## **2.8 PRIMER FOR CONCRETE SUBFLOORS:**

- A. Provide in accordance with Section 09 05 16, SUBSURFACE PREPARATION FOR FLOOR FINISHES.

## **2.9 LEVELING COMPOUND FOR CONCRETE FLOORS:**

- A. Provide cementitious products with latex or polyvinyl acetate resins in the mix in accordance with Section 09 05 16, SUBSURFACE PREPARATION FOR FLOOR FINISHES.

## **2.10 CLEANERS:**

- A. Cleaners: As recommended in writing by floor tile manufacturer.

## **2.11 MOULDING:**

- A. Provide tapered mouldings of clear anodized aluminum and types as indicated on the construction documents for both edges and transitions of flooring materials specified. Provide vertical lip on moulding of maximum 6 mm (1/4 inch). Provide bevel change in level between 6 and 13 mm (1/4 and 1/2 inch) with a slope no greater than 1:2.
- B. Fasteners for Aluminum Mouldings: Stainless steel of type required for substrate condition.

# **PART 3 - EXECUTION**

## **3.1 ENVIRONMENTAL REQUIREMENTS:**

- A. Maintain flooring materials and areas to receive resilient flooring at a temperature above 20 degrees C (68 degrees F) for three (3) days before application, during application, and two (2) days after application, unless otherwise directly by the flooring manufacturer for the flooring being installed. Maintain a minimum temperature of 13 degrees C (55 degrees F) thereafter. Provide adequate ventilation to remove moisture from area and to comply with regulations limiting concentrations of hazardous vapors.
- B. Do not install flooring until building is permanently enclosed and wet construction in or near areas to receive tile materials is complete, dry, and cured.

## **3.2 SUBFLOOR TESTING AND PREPARATION:**

- A. Prepare and test surfaces to receive resilient tile and adhesive as per Section 09 05 16, SUBSURFACE PREPARATION FOR FLOOR FINISHES.
  - 1. Remove existing resilient flooring and existing adhesive.
- B. Prepare concrete substrates in accordance with ASTM F710.



### 3.3 INSTALLATION:

- A. Install in accordance with manufacturer's instructions for application and installation unless specified otherwise.
- B. Mix tile from at least two containers. An apparent line either of shades or pattern variance is not acceptable.
- C. Tile Layout:
  - 1. If layout is not shown on construction documents, lay tile symmetrically about center of room or space with joints aligned.
  - 2. Vary edge width as necessary to maintain full size tiles in the field, no edge tile to be less than 1/2 the field tile size, except where irregular shaped rooms make it impossible.
  - 3. Place tile pattern in the same direction; do not alternate tiles unless specifically indicated in the construction documents to the contrary.
- D. Application:
  - 1. Adhere floor tile to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
  - 2. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
  - 3. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
  - 4. Roll tile floor with a minimum 45 kg (100 pound) roller.
- E. Seal joints at pipes with sealants in accordance with Section 07 92 00, JOINT SEALANTS.
- F. Installation of Edge Strips:
  - 1. Locate edge strips under centerline of doors unless otherwise shown on Construction Documents.
  - 2. Set resilient edge strips in adhesive. Anchor metal edge strips with anchors and screws.
  - 3. Where tile edge is exposed, butt edge strip to touch along tile edge.
  - 4. Where thin-set ceramic tile abuts resilient tile, set edge strip against floor file and against the ceramic tile edge.

**3.4 CLEANING AND PROTECTION:**

- A. Clean adhesive marks on exposed surfaces during the application of resilient materials before the adhesive sets. Exposed adhesive is not acceptable.
- B. Keep traffic off resilient material for a minimum of 72 hours after installation.
- C. Clean flooring as recommended in accordance with manufacturer's printed maintenance instructions and within the recommended time frame. As required by the manufacturer, apply the recommended number of coats and type of finish in accordance with manufacturer's written instructions.
- D. When construction traffic occurs over tile, cover resilient materials with reinforced kraft paper properly secured and maintained until removal is directed by COR. At entrances and where wheeled vehicles or carts are used, cover tile with plywood, hardboard, or particle board over paper, secured and maintained until removal is directed by COR.
- E. When protective materials are removed, and immediately prior to acceptance, replace damaged tile and mouldings, re-clean resilient materials.

**3.5 LOCATION:**

- A. Unless otherwise indicated in Construction Documents, install tile flooring, under areas where casework, laboratory and pharmacy furniture, and other equipment occur.
- B. Extend tile flooring for room into adjacent closets and alcoves.

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**SECTION 09 68 00  
CARPETING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. Section specifies carpet, edge strips, adhesives, and other items required for complete installation.

**1.2 RELATED WORK:**

- A. Resilient Wall Base: Section 09 65 13, RESILIENT BASE AND ACCESSORIES.
- B. Testing of Concrete Floors before Installation: Section 09 05 16, SUBSURFACE PREPARATION FOR FLOOR FINISHES.

**1.3 QUALITY ASSURANCE:**

- A. Installer Qualifications: A company specializing in carpet installation with a minimum three (3) years' experience and employing experienced flooring installers who have retained, and currently hold, an INSTALL Certification, or a certification from a comparable certification program, and a valid OSHA 10 certification.
  - 1. Installers shall be certified by INSTALL or a comparable certification program with the following minimum criteria:
    - a. US Department of Labor approved four (4) year apprenticeship program, 160 hours a year.
    - b. Career long training.
    - c. Manufacturer endorsed training.
    - d. Fundamental journeyman skills certification.

**1.4 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data:
  - 1. Manufacturer's catalog data and printed documentation stating physical characteristics, durability, resistance to fading, and flame resistance characteristics for each type of carpet material and installation accessory.
  - 2. Manufacturer's printed installation instructions for the carpet, including preparation of installation substrate, seaming techniques and recommended adhesives and tapes.
- C. Samples:
  - 1. Carpet: "Production Quality" samples 305 x 305 mm (12 x 12 inches) of carpets, showing quality, pattern and color identified in Finish Schedule on the Drawings.

- 2. Floor Edge Strip (Molding): 152 mm (6 inches) long of each color and type identified in Finish Schedule on the Drawings.
- 3. Base Edge Strip (Molding): 152 mm (6 inches) long of each color identified in Finish Schedule on the Drawings.
- D. Shop Drawings: Installers layout plan showing cuts for carpet module.
- E. Maintenance Data: Carpet manufacturer's maintenance instructions describing recommended type of cleaning equipment and material, spotting and cleaning methods and cleaning cycles.
- F. Installer's Qualifications.
- G. Manufacturer's warranty.

**1.5 DELIVERY AND STORAGE:**

- A. Deliver carpet in manufacturer's original wrappings and packages clearly labeled with manufacturer's brand name, size, dye lot number, and related information. Transport carpet to Project site in a manner that prevents damage and distortion that might render it unusable. When bending or folding is unavoidable for delivery purposes, unfold carpet and lay flat immediately.
- B. Deliver adhesives in containers clearly labeled with manufacturer's brand name, number, installation instructions, safety instructions, and flash points.
- C. Store in a clean, dry, well-ventilated area, protected from damage and soiling. Before installation, acclimate carpet to the atmospheric conditions of the areas in which it will be installed for two (2) days prior to installation

**1.6 ENVIRONMENTAL REQUIREMENTS:**

- A. Maintain areas in which carpeting is to be installed at a temperature between 18 - 35 degrees C (65 - 95 degrees F) with a maximum relative humidity of 65 percent for two (2) days before installation, during installation, and for three (3) days after installation.
- B. Minimum Substrate Surface Temperature: 18 degrees C (65 degrees F) at time of installation.
- C. Three (3) days after installation, maintain minimum temperature of 10 degrees C (50 degrees F) for the duration of the Contract.

**1.7 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".

- B. Manufacturer Warranty: Manufacturer shall warranty their carpet for a minimum of ten (10) years from date of installation and final acceptance by the Government. Submit manufacturer warranty.

#### 1.8 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American National Standards Institute (ANSI):  
ANSI/NSF 140-10.....Sustainable Carpet Assessment Standard
- C. American Association of Textile Chemists and Colorists (AATCC):  
AATCC 16-04.....Colorfastness to Light  
AATCC 134-11.....Electric Static Propensity of Carpets  
AATCC 165-08.....Colorfastness to Crocking: Textile Floor Coverings-AATCC Crockmeter Method  
AATCC 174-11.....Antimicrobial Activity Assessment of New Carpets
- D. ASTM International (ASTM):  
D1335-12.....Tuft Bind of Pile Yarn Floor Coverings  
D3278-96(R2011).....Flash Point of Liquids by Small Scale Closed-Cup Apparatus  
D5116-10.....Determinations of Organic Emissions from Indoor Materials/Products  
D5252-11.....Operation of the Hexapod Tumble Drum Tester  
D5417-11.....Operation of the Vettermann Drum Tester  
E648-14c.....Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
- E. Code of Federal Regulation (CFR):  
40 CFR 59.....Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coating
- F. The Carpet and Rug Institute (CRI):  
CIS.....Carpet Installation Standard
- G. International Standards and Training Alliance (INSTALL)
- H. International Organization for Standardization (ISO):  
2551-81.....Machine-Made Textile Floor Coverings
- I. U.S. Consumer Product and Safety Commission (CPSC):  
16 CFR 1630.....Surface Flammability of Carpets and Rugs

**PART 2 - PRODUCTS****2.1 CARPET:****A. Physical Characteristics:**

1. Carpet free of visual blemishes, streaks, poorly dyed areas, fuzzing of pile yarn, spots or stains and other physical and manufacturing defects.
2. Type:
  - a. Carpet Construction: Tufted.
  - b. Carpet Type: Modular tile 610 by 610 mm square (24 by 24 inch square) with 0.15 percent growth/shrink rate in accordance with ISO 2551.
  - c. Pile Type: Tip shear patterned loop. Pile type and thickness must conform to ADA requirements.
  - d. Pile Fiber: Commercial 100-percent branded (federally registered trademark), nylon continuous filament.
3. Static Control: Provide static control to permanently regulate static buildup to less than 3.5 kV when tested at 20 percent relative humidity and 21 degrees C (70 degrees F) in accordance with AATCC 134.
4. Backing Materials: Provide backing for glue-down installations. Provide impervious moisture backing that is 100-percent PVC free.
  - a. Modular Tile:
    - 1) Primary Backing/Backcoating: Fiberglass-reinforced PVC.
    - 2) Secondary Backing: Reinforced composite closed-cell polymer with recycled content.
5. Appearance Retention Rating (ARR): Carpet to be tested and have the minimum 3.5 - 4.0 severe ARR when tested in accordance with either the ASTM D5252 (Hexapod) or ASTM D5417 (Vettermann) test methods using the number of cycles for short and long term tests as specified in the ASTM standard.
6. Tuft Bind: Comply with ASTM D1335 for tuft bind force required to pull a tuft or loop free from carpet backing with a minimum 36 N (8 pound) average force.
7. Colorfastness to Crocking: Dry and wet crocking and water bleed, comply with AATCC 165 Color Transference Chart for colors, minimum class 4 rating.
8. Colorfastness to Light (AATCC 16, Option 3): Color change between the exposed and unexposed carpet areas equivalent to a minimum of

- Grade 4 on the Gray Scale for Color Change after an exposure of 40 AFU (AATCC fading units) for all colors identified in Finish Schedule on the Drawings.
9. Delamination Strength: Minimum of 440 N/m (2.5 lb./inch) between secondary backing.
  10. Flammability and Critical Radiant Flux Requirements:
    - a. Comply with 16 CFR 1630.
    - b. Test Carpet in accordance with ASTM E648.
    - c. Class I: Minimum critical radiant flux of 0.45 watts per square centimeter (2.9 watts per square inch).
    - d. Carpet in corridors, exits and Medical Facilities to be Class I.
  11. Average Pile Yarn Density (APYD):
    - a. Corridors, lobbies, entrances, common areas or multipurpose rooms, open offices, and waiting areas: Minimum APYD 6000.
    - b. Other areas: Minimum APYD 4000.
  12. Antimicrobial: Nontoxic antimicrobial treatment in accordance with AATCC 174 Part I (qualitative), guaranteed by the carpet manufacturer to last the life of the carpet.
  13. VOC Limits: Use carpet that complies with the following limits for VOC content when tested according to ASTM D5116:
    - a. Carpet, Total VOCs: 0.5 mg/sq.m x hr.
    - b. Carpet, 4-PC (4-Phenylcyclohexene): 0.05 mg/sq.m x hr.
    - c. Carpet, Formaldehyde: 0.05 mg/sq.m x hr.
    - d. Carpet, Styrene: 0.4 mg/sq.m x hr. //

## **2.2 ADHESIVE AND CONCRETE PRIMER:**

- A. Provide water-resistant, mildew-resistant, nonflammable, and nonstaining adhesives and concrete primers for carpet installation. Provide release adhesive as recommended by the carpet manufacturer. Provide adhesives flashpoint of minimum 60 degrees C (140 degrees F) in accordance with ASTM D3278.

## **2.3 SEAMING TAPE:**

- A. Provide tape for seams as recommended by the carpet manufacturer for the type of seam used in installation. Do not use sealants that contain 1,1,1-trichloroethane or toluene.

## **2.4 EDGE STRIPS (MOLDING):**

- A. Metal:
  1. Hammered-surface aluminum, pinless, clamp-down type designed for the carpet being installed.

2. Floor flange not less than 38 mm (1-1/2 inches) wide, face not less than 16 mm (5/8 inch) wide.

3. Finish: Clear anodic coating.

**B. Vinyl Edge Strip:**

1. Beveled floor flange minimum 50 mm (2 inches) wide.

2. Beveled surface to finish flush with carpet for tight joint and other side to floor finish.

3. Color as identified in Finish Schedule on the Drawings.

**PART 3 - EXECUTION**

**3.1 SURFACE PREPARATION:**

A. Contractor to prepare and test surfaces to receive carpet and adhesives as per Section 09 05 16, SUBSURFACE PREPARATION FOR FLOOR FINISHES.

**3.2 GENERAL INSTALLATION:**

A. Isolate area of installation from rest of building.

B. Perform all work by manufacturer's approved installers. Conduct installation in accordance with the manufacturer's printed instructions and CRI CIS.

C. Protect edges of carpet meeting hard surface flooring with molding and install in accordance with the molding manufacturer's printed instructions.

D. Follow ventilation, personal protection, and other safety precautions recommended by the adhesive manufacturer. Continue ventilation during installation and for at least three (3) days following installation.

E. Do not permit traffic or movement of furniture or equipment in carpeted area for 24 hours after installation.

F. Complete other work which would damage the carpet prior to installation of carpet.

G. Follow carpet manufacturer's recommendations for matching pattern and texture directions.

H. Cut openings in carpet where required for installing equipment, pipes, outlets, and penetrations. Bind or seal cut edge of sheet carpet. Use additional adhesive to secure carpets around pipes and other vertical projections.

**3.3 BROADLOOM CARPET INSTALLATION (NOT USED)**

**3.4 MODULAR TILE INSTALLATION:**

A. Install per CRI CIS, Adhesive Application.

B. Lay carpet modules with pile in same direction unless indicated otherwise.



- C. Install carpet modules so that cleaning methods and solutions do not cause dislocation of modules.
- D. Lay carpet modules uniformly to provide tight flush joints free from movement when subject to traffic.

### **3.5 EDGE STRIPS INSTALLATION**

- A. Install edge strips over exposed carpet edges adjacent to uncarpeted finish flooring.
- B. Anchor metal strips to floor with suitable fasteners. Apply adhesive to edge strips, insert carpet into lip and press it down over carpet.
- C. Anchor vinyl edge strip to floor with adhesive. Apply adhesive to edge strip and insert carpet into lip and press lip down over carpet.

### **3.6 PROTECTION AND CLEANING:**

- A. Once a carpet installation is complete, clean up scrap materials and debris, and vacuum the area, using manufacturer-approved equipment. Inspect seams carefully for evenness and protruding backing yarns, and inspect the perimeter of the installation for an acceptable finished appearance.
- B. Protect installed carpet if furniture is being moved, by laying plywood, fiberboard, or porous non-staining sheeting material for minimum time practical. Based on manufacturer guidelines, protect carpet from rolling or foot traffic. Protect against other materials or renovation or construction activities, including dust, debris, paint, contractor traffic, and the like until it is ready for its final use.
- C. Do not move furniture or equipment on unprotected carpeted surfaces.
- D. Just before final acceptance of work, remove protection and vacuum carpet clean.

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**SECTION 09 72 16**  
**VINYL-COATED FABRIC WALL COVERINGS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

A. Section specifies vinyl-coated fabric wall covering and installation.

**1.2 RELATED WORK (NOT USED)**

**1.3 SUBMITTALS:**

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Samples:

1. Each type and pattern as specified.
2. Size: Full width of mill run not less than 450 mm (18 inches) in length.

C. Manufacturer's Certificates:

1. Compliance with WA W-101.
2. Wall covering manufacturer's approval of adhesive.

D. Manufacturer's Literature and Data:

1. Wall covering primer and adhesive.
2. Installation instructions.
3. Maintenance instructions, including recommended materials and methods for maintaining wall covering with precautions in use of cleaning material.

E. Tests: Substrate moisture.

**1.4 QUALITY ASSURANCE:**

- A. Finish one complete wall (full height, not less than 2438 mm (8 feet) in length) of each type (color and pattern) of wall covering showing specified colors and patterns.
- B. After Contracting Officer Representative (COR) approval, the sample installation will serve as a standard for work throughout the Project.

**1.5 DELIVERY, STORAGE AND HANDLING:**

- A. Deliver in original unopened containers bearing the manufacturer's name, brand name, and product designation.
- B. Store in accordance with manufacturer's instructions.
- C. Handle to prevent damage to material.

**1.6 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

## B. ASTM International (ASTM):

E84-14.....Surface Burning Characteristics of Building  
Materials

G21-13.....Determining Resistance of Synthetic Polymeric  
Materials to Fungi

## C. Code of Federal Regulation (CFR):

40 CFR 59.....Determination of Volatile Matter Content, Water  
Content, Density Volume Solids, and Weight  
Solids of Surface Coating

## D. Wallcovering Association (WA):

W-101-13.....Quality Standard Polymer Coated Fabric  
Wallcoverings

**PART 2 - PRODUCTS****2.1 VINYL-COATED FABRIC WALL COVERING:**

A. Comply with WA W-101.

B. Fungi Resistance: ASTM G21, rating of zero (0).

C. Factory-applied clear de-lustered polyvinyl-fluoride (PVF) coating:

1. Minimum 0.0125 mm (1/2 mil) thickness.

2. Do not include PVF coating weight in minimum total weight.

3. Fire hazard classification with PVF coating: Class A unless  
specified otherwise.

D. Type II (Medium Duty).

**2.2 PRIMER AND ADHESIVE:**

A. Adhesive shall have a VOC content of 50 g/L or less when calculated  
according to 40 CFR 59, (EPA Method 24).

B. Vermin-resistant, mildew-resistant, and germicidal inhibiting type  
recommended by wall covering manufacturer for use on substrate to  
receive wall covering.

**2.3 WALL LINER:**

A. Provide a non-woven polyester cellulose blend having a minimum weight  
of 0.125 Kg/square meter (3.7 ounces per square yard) and a total  
minimum thickness of 0.325 mm (0.013 inches). Wall liner is to have a  
flame spread rating of 0-20 and smoke development rating of 0-25 when  
tested in accordance with ASTM E84.

**2.4 EDGE GUARDS OR WAINSCOT CAP TRIM (NOT USED)****PART 3 - EXECUTION****3.1 JOB CONDITIONS:****A. Temperatures:**

1. Do not perform work until surfaces and materials have been maintained at minimum of 16 degrees C (60 degrees F) for three (3) days before work begins.
2. Maintain minimum temperatures of 16 degrees C (60 degrees F) until adhesives are dried or cured.

**B. Lighting:**

1. Do not proceed unless a minimum lighting level of 15 candela per 0.09 square meter (15 candela per square foot) is provided.
2. Measure light level at mid-height of wall.

**C. Ventilation:** Provide continuous ventilation as required to rid the spaces in which the wall coverings are being installed of volatile compounds given off by the wall coverings, sealers, and adhesives and as recommended by the product manufacturer for full drying or curing.**D. Protect other surfaces from damage resulting from installation of wall coverings.** Provide drop cloths, shields and protective equipment to prevent primers, adhesives, or wall covering from fouling adjacent surfaces and in particular, storage and preparation areas.**E. Store flammable rubbish, waste, cloths, and materials which may constitute a fire hazard, in closed metal containers.** Daily remove and properly dispose of flammable wastes from the Project site.**3.2 SURFACE CONDITION AND PREPARATION:****A. Inspect surfaces to receive wall coverings to assure that:**

1. Patches and repairs to substrates are completed.
2. Surfaces are clean, smooth and prime-painted.

**B. Surfaces to receive wall covering are to be dry.** Test moisture content of plaster walls with an electric moisture meter. The moisture content is not permitted to be more than 5 percent. Submit test results.**C. Do not proceed until discovered defects have been corrected by other trades and surfaces are ready to receive wall covering.****D. Carefully remove electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings, and fastenings, prior to starting work, and store items for reinstallation.****3.3 APPLICATION OF ADHESIVE:****A. Mix and apply adhesives in accordance with manufacturer's directions.**

- B. Prevent adhesive from getting on face of wall covering.
- C. Apply adhesive to wall covering back.

### **3.4 INSTALLATION:**

- A. Use wall covering of same batch or run in each area. Use fabric rolls in consecutive numerical sequence of manufacture.
- B. Install material completely adhered, smooth, clean, without wrinkles, air pockets, gaps, or overlaps.
- C. Extend wall covering continuous behind non-built-in casework and other items which are not bolted to the walls.
- D. Install wall covering before installation of resilient base. Extend wall covering not more than 6 mm (1/4 inch) below top of resilient base.
- E. Install wall covering panels consecutively in order in which they are cut from the roll including filling spaces above or below windows, doors, or similar penetrations.
- F. Do not install horizontal seams.
- G. Except on match patterns, hang fabric by reversing alternate strips, except as recommended by the manufacturer.
- H. Cutting:
  - 1. Cut on a work table with a straight edge.
  - 2. Joints or seams that are not cut clean are unacceptable.
  - 3. Trim additional selvage to achieve a color and pattern match at seams. Overlapped seams are not allowed.
  - 4. Do not double cut seams on wall unless specified.
  - 5. If double-cutting on the wall is necessary, place a 3-inch-wide strip of Type I wall covering under pasted edge.
    - a. Do not cut into wall surface.
    - b. After cutting, remove strip and excess adhesive from seam before proceeding to next seam.
    - c. Smooth down seam in adhesive for tight bond and joint.
- I. Trim strip-matched patterns which are not factory pre-trimmed.
- J. Inside Corners:
  - 1. Wrap wall covering around corners.
  - 2. Do not seam within 50 mm (2 inches) of inside corners.
  - 3. Double-cut seams.
- K. Outside Corners:
  - 1. Wrap wall covering around corners.
  - 2. Do not seam within 152 mm (6 inches) of outside corners.

3. Double-cut seams.

### **3.5 PATCHING:**

- A. Replace surface-damaged wall covering in a space as specified for new work:
  1. Replace full height of surface.
  2. Replace from break in plane to break in plane when same batch or run is not used.
  3. Double-cut seams.
  4. Adjoining differential colors from separate batches or runs is not acceptable.
- B. Correct loose or raised seams with adhesives to lay flat with tight bonded joint as specified for new work.

### **3.6 CLEANING AND INSTALLING TEMPORARY REMOVED ITEMS:**

- A. Remove adhesive from wall covering as work proceeds.
- B. Remove adhesives where spilled, splashed, or splattered on wall coverings or adjacent surfaces in a manner not to damage surface from which it is removed.
- C. Upon completion of work, leave wall covering free of dirt or soil.
- D. Remove all debris associated with wall covering installation.
- E. Reinstall previously removed electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings, and fastenings.

- - - E N D - - -





**SECTION 09 75 00****STONE FACING****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Section includes prefabricated natural stone veneer rock panel wall systems for interior use.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 25 00 - Weather Barriers.
- B. Section 09 30 13 - Ceramic-Porcelain Tiling: Cement-board substrate.
  - 1. Securely fix cement board to the wall's framing:
    - a. First glue board to the framing by covering the entire frame where contact with the cement board is made with a high-performance mastic type adhesive.
    - b. Then screw board to the framing at 24-inch centers using screws that are a minimum of 2 inches long.
- C. Section 09 22 16 - Non-Structural Metal Framing: Formed steel framed supporting wall.

**1.03 REFERENCES**

- A. American National Standards Institute (ANSI):
  - 1. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar.
  - 2. ANSI A118.11 - American National Standard Specifications for EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar.

**1.04 SUBMITTALS**

- A. Action Submittals:
  - 1. Product Data: Submit manufacturer's product specifications and descriptive literature.
    - a. Include data for application materials.
  - 2. Samples for Verification:
    - a. For rock panel system, submit two sample panels, approximately 6 by 6 inches, containing full-size samples of specified rock panel system illustrating anticipated variation in color and texture, complete with specified sealants.
    - b. For each color of pointing mortar required.
- B. Quality-Assurance Submittals:
  - 1. Mix Designs: For mortar.
  - 2. Qualification Data: Submit data verifying qualifications and years of experience for installer. Include list of completed projects having similar scope of Work identified by name, location, date, reference names, and phone numbers.
  - 3. Manufacturer's Instructions.
- C. Closeout Submittals:
  - 1. Maintenance Data: For rock panel systems to include in maintenance manuals.

**1.05 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. Installer Qualifications: A qualified installer who employs experience as a tile setter. Other qualified installers may be stonemasons and stone fitters.

**PART 2 - PRODUCTS****2.01 MANUFACTURER**

- A. Source Limitations: Obtain primary products through one source from a single manufacturer for entire Project.
  - 1. Furnish secondary products only of type and from source recommended by manufacturer of primary materials.
- B. Basis-of-Design Products: As manufactured by Norstone Pty Ltd of Australia +612 9944 6711, [www.norstoneusa.com](http://www.norstoneusa.com).

**2.02 WALL ROCK PANELS**

- A. Rock Panel Stone Color: See Finish Schedule on the Drawings.
- B. Individual Rock Panel Size: 24 inches (610 mm) long by 6 inches (152 mm) high.
  - 1. Provide matching factory-fabricated corner units with 16 inches (406 mm) and 8 inches (203 mm) long returns by 6 inches (152 mm) high.
- C. Rock Panel Thickness: Varying randomly from 5/8 (15 mm) inch to 1 1/2 (40 mm) inch.
- D. Panels shall be fabricated using multiple pieces of stone to different rectangular sizes. Utilize individual stone pieces of varying heights and lengths and thickness to achieve desired three-dimensional aesthetic effects.
  - 1. Adhere individual stones together using two-component epoxy adhesive.

**2.03 SETTING MATERIALS**

- A. Polymer-Modified Thin-Set for Tile-Set Applications: Meeting or exceeding ANSI A118.4 and ANSI A118.11.
  - 1. Acceptable Manufacturer and Product:
    - a. Laticrete International, Inc.; 255 Multimax: [www.laticrete.com](http://www.laticrete.com).
- B. Water: Potable

**2.04 MORTAR MIXES**

- A. Polymer-Modified Thin-Set Setting Mortar: See Part-2 article entitled "Setting Materials" above.

**PART 3 - EXECUTION****3.01 PREPARATION**

- A. Surface Preparation: Follow manufacturer's instructions for type of rock panel system and substrate.

**3.02 SETTING OF ROCK PANEL SYSTEM - GENERAL**

- A. Install stone veneer panels in accordance with manufacturer's installation instructions.
- B. Perform necessary field-cutting and -trimming as rock panels are set.
  - 1. Use wet tile saws with diamond blades to cut rock panels. Cut lines straight and true, with edges eased slightly to prevent snipping.
- C. Lay out stone veneer panels prior to setting with mortar to ensure proper fit and alignment.
- D. Scribe and field-cut stone veneer as necessary to fit at obstructions. Produce neat joints of size specified or indicated. Fix stone veneer panels as tight as possible to eliminate any visible gaps or unsightly joints.
- E. Install corner units first.

- F. Install remaining stone veneer panels with vertical end joints staggered randomly to form an offset pattern. Never stack bond rock panels.
- G. Install rock panels working from the bottom up using mortar-less joints.
- H. Remove mortar or thin-set droppings as work progresses.
- I. Isolation and Movement Joints: Prepare joints and apply sealants of type indicated to comply with applicable requirements in Section 07 92 00 - Joint Sealants.
  - 1. Keep sealant joints free of mortar and other rigid materials.
  - 2. Rake out for joint sealant to full depth of system before setting mortar has hardened.
  - 3. Rake joints with square bottoms and clean sides.
  - 4. Perimeter and Isolation Joints: Provide in widths and at locations indicated.
  - 5. Expansion and Control (Contraction) Joints: Locate and install according to Drawings and approved Shop Drawings.

### **3.03 INSTALLATION OVER CEMENT BOARD**

- A. Coat backs of rock panel system units and face of cement board backup with cement-paste bond coat, then butter both surfaces with setting mortar at least 3/8inch (10mm) thick. Tap units into place, completely filling space between units and backup.

### **3.04 CLEANING**

- A. Do not use wire brushes, acid-type cleaning agents, cleaning agents containing caustic compounds or abrasives, or other materials or methods that could damage stone.
- B. In-Progress Cleaning: Clean rock panel system as work progresses.
- C. Final Cleaning: Clean rock panel system no fewer than six days after completion of sealing, using clean water and stiff-bristle fiber brushes.

- - - END - - -



**SECTION 09 91 00**  
**PAINTING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the painting and finishing as shown on the construction documents and/or specified herein, including, but not limited to, the following:
1. Prime coats which may be applied in shop under other sections.
  2. Prime painting unprimed surfaces to be painted under this Section.
  3. Painting items furnished with a prime coat of paint, including touching up of or repairing of abraded, damaged, or rusted prime coats applied by others.
  4. Painting ferrous metal (except stainless steel) exposed to view.
  5. Painting galvanized ferrous metals exposed to view.
  6. Painting gypsum drywall exposed to view.
  7. Painting of wood exposed to view, except items which are specified to be painted or finished under other Sections of these specifications.
  8. Painting pipes, pipe coverings, conduit, ducts, insulation, hangers, supports, and other mechanical and electrical items and equipment exposed to view.
  9. Painting surfaces above, behind, or below grilles, gratings, diffusers, louvers, lighting fixtures, and the like, which are exposed to view through these items.
  10. Painting includes shellacs, stains, varnishes, coatings specified, and striping or markers and identity markings.
  11. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory-finished items.
  12. Painting of any surface not specifically mentioned to be painted herein or on construction documents, but for which painting is obviously necessary to complete the job, or work which comes within the intent of these specifications, is to be included as though specified.

**1.2 RELATED WORK:**

- A. Activity Hazard Analysis: Section 01 35 26, SAFETY REQUIREMENTS.
- B. Shop-prime painting of steel and ferrous metals: Division 05 - METALS, Division 08 - OPENINGS; Division 10 - SPECIALTIES; Division 11 - EQUIPMENT; Division 12 - FURNISHINGS; Division 21 - FIRE

SUPPRESSION; Division 22 - PLUMBING; Division 23 - HEATING; VENTILATION AND AIR-CONDITIONING; Division 26 - ELECTRICAL; Division 27 - COMMUNICATIONS; and Division 28 - ELECTRONIC SAFETY AND SECURITY sections.

- C. Contractor Option: Prefinished flush doors with transparent finishes:  
Section 08 14 00, INTERIOR WOOD DOORS.

### 1.3 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Painter qualifications.
- C. Manufacturer's Literature and Data:
1. Before work is started, or sample panels are prepared, submit manufacturer's literature and technical data, the current Master Painters Institute (MPI) "Approved Product List" indicating brand label, product name, and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use subsequent MPI "Approved Product List", however, only one (1) list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.
- D. Sample Panels:
1. After painters' materials have been approved and before work is started submit sample panels showing each type of finish and color specified.
  2. Panels to Show Color: Composition board, 100 x 250 mm (4 x 10 inch).
  3. Panel to Show Transparent Finishes: Wood of same species and grain pattern as wood approved for use, 100 x 250 mm (4 x 10 inch face) minimum, and where both flat and edge grain will be exposed, 250 mm (10 inches) long by sufficient size, 50 x 50 mm (2 x 2 inch) minimum or actual wood member to show complete finish.
  4. Attach labels to panel stating the following:
    - a. Federal Specification Number or manufacturers name and product number of paints used.
    - b. Specification code number specified.
    - c. Product type and color.
    - d. Name of project.
  5. Strips showing not less than 50 mm (2 inch) wide strips of undercoats and 100 mm (4 inch) wide strip of finish coat.

- E. Sample of identity markers if used.
- F. Manufacturers' Certificates indicating compliance with specified requirements:
  - 1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.
  - 2. High-temperature aluminum paint.
  - 3. Epoxy coating.

#### **1.4 DELIVERY AND STORAGE:**

- A. Deliver materials to Project site in manufacturer's sealed container marked to show following:
  - 1. Name of manufacturer.
  - 2. Product type.
  - 3. Batch number.
  - 4. Instructions for use.
  - 5. Safety precautions.
- B. In addition to manufacturer's label, provide a label legibly printed as following:
  - 1. Federal Specification Number, where applicable, and name of material.
  - 2. Surface upon which material is to be applied.
  - 3. Specify Coat Types: Prime; body; finish; etc.
- C. Maintain space for storage and handling of painting materials and equipment in a ventilated, neat, and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.
- D. Store materials at Project site at least 24 hours before using, at a temperature between 7 and 30 degrees C (45 and 85 degrees F).

#### **1.5 QUALITY ASSURANCE:**

- A. Qualification of Painters: Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces. Submit evidence that key personnel have successfully performed surface preparation and application of coating on a minimum of three (3) similar projects within the past three (3) years.
- B. Paint Coordination: Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon request from other subcontractors, furnish information on the characteristics of the finish materials proposed to be used, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-

prime as required. Notify the Contracting Officer Representative (COR) in writing of any anticipated problems using the coating systems as specified with substrates primed by others.

#### **1.6 MOCK-UP PANEL:**

- A. In addition to the samples specified herein to be submitted for approval, apply in the field, at their final location, each type and color of approved paint materials, applied 3.05 m (10 feet) wide, floor to ceiling of wall surfaces, before proceeding with the remainder of the work, for approval by the COR. Paint mock-ups to include one (1) door and frame assembly.
- B. Finish and texture approved by COR will be used as a standard of quality and workmanship for remainder of work.
- C. Repaint individual areas which are not approved, as determined by the COR, until approval is received.

#### **1.7 REGULATORY REQUIREMENTS:**

- A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.
  - 1. Volatile Organic Compounds (VOC) Emissions Requirements: Field-applied paints and coatings that are inside the waterproofing system shall not exceed limits of authorities having jurisdiction.
  - 2. Lead-Based Paint:
    - a. Comply with Section 410 of the Lead-Based Paint Poisoning Prevention Act, as amended, and with implementing regulations promulgated by Secretary of Housing and Urban Development.
    - b. Regulations concerning prohibition against use of lead-based paint in federal and federally assisted construction, or rehabilitation of residential structures are set forth in Subpart F, Title 24, Code of Federal Regulations, Department of Housing and Urban Development.
    - c. Do not use coatings having a lead content over 0.06 percent by weight of non-volatile content.
  - 3. Asbestos: Provide materials that do not contain asbestos.
  - 4. Chromate, Cadmium, Mercury, and Silica: Provide materials that do not contain zinc-chromate, strontium-chromate, cadmium, mercury or mercury compounds, or free crystalline silica.
  - 5. Human Carcinogens: Provide materials that do not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.
  - 6. Use high-performance acrylic paints in place of alkyd paints.



**1.8 SAFETY AND HEALTH**

- A. Apply paint materials using safety methods and equipment in accordance with the following:
  - 1. Comply with applicable Federal, State, and local laws and regulations, and with the ACCIDENT PREVENTION PLAN, including the Activity Hazard Analysis (AHA) as specified in Section 01 35 26, SAFETY REQUIREMENTS. The AHA is to include analyses of the potential impact of painting operations on painting personnel and on others involved in and adjacent to the work zone.
- B. Safety Methods Used during Paint Application: Comply with the requirements of SSPC PA Guide 10.
- C. Toxic Materials: To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:
  - 1. The applicable manufacturer's Material Safety Data Sheets (MSDS) or local regulation.
  - 2. 29 CFR 1910.1000.
  - 3. ACHIH-BKLT and ACGIH-DOC, threshold limit values.

**1.9 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by basic designation only.
- B. American Conference of Governmental Industrial Hygienists (ACGIH):
  - ACGIH TLV-BKLT-2012.....Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs)
  - ACGIH TLV-DOC-2012.....Documentation of Threshold Limit Values and Biological Exposure Indices, (Seventh Edition)
- C. ASME International (ASME):
  - A13.1-07(R2013).....Scheme for the Identification of Piping Systems
- D. Code of Federal Regulation (CFR):
  - 40 CFR 59.....Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coating
- E. Commercial Item Description (CID):
  - A-A-1272A.....Plaster Gypsum (Spackling Compound)
- F. Master Painters Institute (MPI):
  - 1.....Aluminum Paint
  - 8.....Exterior Alkyd, Flat MPI Gloss Level 1



141.....Interior High Performance Latex (SG) MPI Gloss  
Level 5

G. Society for Protective Coatings (SSPC):

SSPC SP 1-82(R2004).....Solvent Cleaning

SSPC SP 2-82(R2004).....Hand Tool Cleaning

SSPC SP 3-28(R2004).....Power Tool Cleaning

SSPC SP 10/NACE No.2.....Near-White Blast Cleaning

SSPC PA Guide 10.....Guide to Safety and Health Requirements

H. U.S. National Archives and Records Administration (NARA):

29 CFR 1910.1000.....Air Contaminants

I. Underwriter's Laboratory (UL)

**PART 2 - PRODUCTS**

**2.1 MATERIALS:**

- A. Conform to the coating specifications and standards referenced in PART 3. Submit manufacturer's technical data sheets for specified coatings and solvents.

**2.2 PAINT PROPERTIES:**

- A. Use ready-mixed (including colors), except two-component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately, and paints requiring specified additives.
- B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.
- C. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only to recommended limits.
- D. VOC test method for paints and coatings shall be in accordance with 40 CFR 59 (EPA Method 24). Part 60, Appendix A with the exempt compounds' content determined by Method 303 (Determination of Exempt Compounds) in the South Coast Air Quality Management District's (SCAQMD) "Laboratory Methods of Analysis for Enforcement Samples" manual.

**2.3 PLASTIC TAPE:**

- A. Pigmented vinyl plastic film in colors as specified.
- B. Pressure sensitive adhesive back.
- C. Widths as shown on Construction Documents.

**PART 3 - EXECUTION****3.0 EXAMINATION**

- A. In areas requiring new work and patching, verify existing finishes shown in the finish schedule and on the plans. Immediately call any discrepancies to the COR's attention. New wall and ceiling finishes shall match the existing finishes, unless otherwise noted.
1. For existing ceiling patching, where ceiling is cut out or portions removed for removal of existing devices or installation of new work, the disturbed portion shall be patched to match the existing ceiling finish. Unless otherwise noted, the entire ceiling area shall be repainted where ceilings are gypsum board.
  2. Freestanding columns in a room shall receive the same finish as the room wall, unless otherwise noted.
  3. Where new finishes are applied to existing, the existing finishes shall be removed and/or the existing surfaces prepared as required to receive new finishes, unless otherwise noted. Where required to accommodate the new finishes, the mechanical, plumbing, and electrical trades shall disconnect and remove their respective devices and items from the existing wall or ceiling and relocate to their final position in the new construction. Such devices shall include but not be limited to electrical switches, panels, outlets, thermostats, grilles, plumbing fixtures, medical gas outlets, and the like. The respective trade shall also be responsible for any permanent connections of those items which are relocated.
  4. Where wall surfaces are patched to match the existing, the new finish shall be applied to the nearest corner or break in the wall plane, unless otherwise noted.
  5. Where existing walls are intended to receive a new finish, any existing painted items in or on the wall (doors, door frames, electrical panels, and the like) shall be repainted to match or coordinate with the new finish, unless otherwise noted.
  6. Gypsum board walls in an existing building from which vinyl wall fabric is removed, shall be cleaned of all adhesive and a skim coat of plaster shall be applied to receive the new finish.
  7. In rooms scheduled to receive new finishes or millwork that is to receive new finishes, existing fixtures, devices, hardware, and accessories shall be temporarily removed as required to allow the new

finish to extend under or behind the fixture or accessory and then reset.

### **3.1 JOB CONDITIONS:**

- A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and application of painting materials.
  - 1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, toxic fumes, fire, explosion, or other harm.
  - 2. Deposit soiled cleaning rags and waste materials in metal containers approved for that purpose. Dispose of such items off-site at end of each day's work.
- B. Atmospheric and Surface Conditions:
  - 1. Do not apply coating when air or substrate conditions include:
    - a. Less than 3 degrees C (5 degrees F) above dew point.
    - b. Below 10 degrees C (50 degrees F) or over 35 degrees C (95 degrees F), unless specifically pre-approved by the COR and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.
    - c. When the relative humidity exceeds 85 percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
  - 2. Maintain interior temperatures until paint dries hard.
  - 3. Do not paint in direct sunlight or on surfaces that the sun will warm.
  - 4. Apply only on clean, dry, and frost-free surfaces except as follows:
    - a. Apply water-thinned acrylic and cementitious paints to damp (not wet) surfaces only when allowed by manufacturer's printed instructions.
  - 5. Varnishing:
    - a. Apply in clean areas and in still air.
    - b. Before varnishing, vacuum and dust area.
    - c. Immediately before varnishing, wipe down surfaces with a tack rag.

### **3.2 INSPECTION:**

- A. Examine the areas and conditions where painting and finishing are to be applied and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

**3.3 GENERAL WORKMANSHIP REQUIREMENTS:**

- A. Application may be by brush or roller. Spray application only upon acceptance from the COR in writing.
- B. Furnish to the COR a painting schedule indicating when the respective coats of paint for the various areas and surfaces will be completed. This schedule is to be kept current as the job progresses.
- C. Protect work at all times. Protect all adjacent work and materials by suitable covering or other method during progress of work. Upon completion of the work, remove all paint and varnish spots from floors, glass, and other surfaces. Remove from the premises all rubbish and accumulated materials of whatever nature not caused by others and leave work in a clean condition.
- D. Remove and protect hardware, accessories, device plates, lighting fixtures, factory-finished work, and similar items, or provide in-place protection. Upon completion of each space, carefully replace all removed items by workmen skilled in the trades involved.
- E. When indicated to be painted, remove electrical panel box covers and doors before painting walls. Paint separately and re-install after all paint is dry.
- F. Materials are to be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, holidays, brush marks, air bubbles, and excessive roller stipple.
- G. Apply materials with a coverage to hide substrate completely. When color, stain, dirt, or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance, and coverage, at no additional cost to the Government.
- H. All coats are to be dry to manufacturer's recommendations before applying succeeding coats.
- I. After the application of the first coat, all suction spots or "hot spots" in gypsum are to be touched up before applying the second coat.
- J. Do not apply paint behind frameless mirrors that use mastic for adhering to wall surface.

**3.4 SURFACE PREPARATION:**

- A. General:
  - 1. The Contractor shall be held wholly responsible for the finished appearance and satisfactory completion of painting work. Properly prepare all surfaces to receive paint, which includes cleaning,

sanding, and touching-up of all prime coats applied under other Sections of the work. Broom-clean all spaces before painting is started. All surfaces to be painted or finished shall be completely dry, clean, and smooth.

2. See other sections of specifications for specified surface conditions and prime coat.
3. Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
4. Clean surfaces before applying paint or surface treatments with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.
5. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

a. Gypsum Board: 12 percent.

B. Wood:

1. Sand to a smooth even surface and then dust off.
2. Sand surfaces showing raised grain smooth between each coat.
3. Wipe surface with a tack rag prior to applying finish.
4. Surface painted with an opaque finish:
  - a. Coat knots, sap and pitch streaks with MPI 36 (Knot Sealer) before applying paint.
  - b. Apply two coats of MPI 36 (Knot Sealer) over large knots.
5. After application of prime or first coat of stain, fill cracks, nail and screw holes, depressions, and similar defects with wood filler paste. Sand the surface to make smooth and finish flush with adjacent surface.
6. Before applying finish coat, reapply wood filler paste if required, and sand surface to remove surface blemishes. Finish flush with adjacent surfaces.
7. Fill open-grained wood such as oak, walnut, ash, and mahogany with MPI 91 (Wood Filler Paste), colored to match wood color.
  - a. Thin filler in accordance with manufacturer's instructions for application.

- b. Remove excess filler, wipe as clean as possible, dry, and sand as specified.
- C. Ferrous Metals:
  - 1. Remove oil, grease, soil, drawing and cutting compounds, flux, and other detrimental foreign matter in accordance with SSPC-SP 1 (Solvent Cleaning).
  - 2. Remove loose mill scale, rust, and paint, by hand or power-tool cleaning, as defined in SSPC-SP 2 (Hand Tool Cleaning) and SSPC-SP 3 (Power Tool Cleaning).
  - 3. Fill dents, holes, and similar voids and depressions in flat exposed surfaces of hollow steel doors and frames and similar items specified to have semi-gloss or gloss finish with TT-F-322D (Filler, Two-Component Type, for Dents, Small Holes and Blow-Holes). Finish flush with adjacent surfaces.
    - a. Fill flat-head countersunk screws used for permanent anchors.
    - b. Do not fill screws of item intended for removal such as glazing beads.
  - 4. Spot-prime abraded and damaged areas in shop-primed coat which expose bare metal with same type of paint used for prime coat. Feather edge of spot-prime to produce smooth finish coat.
  - 5. Spot-prime abraded and damaged areas which expose bare metal of factory-finished items with paint as recommended by manufacturer of item.
- D. Zinc-Coated (Galvanized) Metal, and Aluminum Surfaces Specified Painted:
  - 1. Clean surfaces to remove grease, oil, and other deterrents to paint adhesion in accordance with SSPC-SP 1 (Solvent Cleaning).
  - 2. Spot-coat abraded and damaged areas of zinc-coating which expose base metal on hot-dip zinc-coated items with MPI 18 (Organic Zinc-Rich Coating). Prime or spot-prime with MPI 134 (Waterborne Galvanized Primer) or MPI 135 (Non-Cementitious Galvanized Primer) depending on finish coat compatibility.
- E. Gypsum Board:
  - 1. Remove efflorescence, and loose or chalking plaster or finishing materials.
  - 2. Remove dust, dirt, and other deterrents to paint adhesion.
  - 3. Fill holes, cracks, and other depressions with CID-A-A-1272A finished flush with adjacent surface, with texture to match texture of adjacent surface. Patch holes over 25 mm (1-inch) in diameter as specified in Section 09 29 00 ("Gypsum Board").



**3.5 PAINT PREPARATION:**

- A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment, and uniform composition.
- B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.
- C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.
- D. Mix two-component and two-part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.
- E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

**3.6 APPLICATION:**

- A. Start of surface preparation or painting will be construed as acceptance of the surface as satisfactory for the application of materials.
- B. Unless otherwise specified, apply paint in three (3) coats; prime, body, and finish. When two (2) coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.
- C. Apply each coat evenly and cover substrate completely.
- D. Allow not less than 48 hours between applications of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by COR.
- E. Apply by brush or roller. Spray application for new or existing occupied spaces only upon approval by acceptance from COR in writing.
  - 1. Apply painting materials specifically required by manufacturer to be applied by spraying.
  - 2. In new construction and in existing occupied spaces, where paint is applied by spray, mask or enclose with polyethylene, or similar air-tight material with edges and seams continuously sealed, including items specified in "Building and Structural Work Field Painting"; "Work not Painted"; motors, controls, telephone, and electrical equipment, fronts of sterilizers, and other recessed equipment and similar prefinished items.
- F. Do not paint in closed position operable items and similar items except overhead roll-up doors and shutters.

**3.7 PRIME PAINTING:**

- A. After surface preparation, prime surfaces before application of body and finish coats, except as otherwise specified.
- B. Spot-prime and apply body coat to damaged and abraded painted surfaces before applying succeeding coats.
- C. Additional field-applied prime coats over shop- or factory-applied prime coats are not required.
- D. Prime rabbets for stop and face glazing of wood, and for face glazing of steel.
- E. Wood and Wood Particleboard:
  - 1. Use same kind of primer specified for exposed face surface.
    - a. Interior wood except for transparent finish: MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), thinned if recommended by manufacturer.
    - b. Transparent finishes as specified under "Transparent Finishes on Wood Except Floors Article".
  - 2. Apply one (1) coat of sealer MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat) as soon as delivered to Project site to surfaces of unfinished woodwork, except concealed surfaces of shop-fabricated or -assembled millwork and surfaces specified to have varnish, stain, or natural finish.
- F. Metals:
  - 1. Steel and Iron: Use MPI 101 (Cold Curing Epoxy Primer) where finish is specified.
  - 2. Zinc-Coated Steel and Iron: MPI 134 (Waterborne Galvanized Primer).
  - 3. Aluminum Scheduled to be Painted: MPI 95 (Fast Drying Metal Primer).
  - 4. Machinery not Factory-Finished: MPI 9 (Exterior Alkyd Enamel).
  - 5. AsphaltCoated Metal: MPI 1 (Aluminum Paint).
- G. Gypsum Board and Hardboard:
  - 1. Surfaces Scheduled to Have MPI 53 (Interior Latex, Flat), MPI Gloss Level 1; MPI 52 (Interior Latex, MPI Gloss Level 3); or MPI 54 (Interior Latex, Semi-Gloss, MPI Gloss Level 5) Finish: Use MPI 53 (Interior Latex, MPI Gloss Level 3); MPI 52 (Interior Latex, MPI Gloss Level 3); and MPI 54 (Interior Latex, Semi-Gloss, MPI Gloss Level 5), respectively.

2. Primer: MPI 50 (Interior Latex Primer Sealer) except use MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat) in shower and bathrooms.
3. Use // MPI 101 (Cold Curing Epoxy Primer) for surfaces scheduled to receive MPI 77 (Epoxy Cold Cured, Gloss) // // MPI 98 (High Build Epoxy Coating) // // MPI 108 (High Build Epoxy Marine Coating) finish //.

### **3.8 EXTERIOR FINISHES (NOT USED)**

### **3.9 INTERIOR FINISHES:**

- A. Apply following finish coats over prime coats in spaces or on surfaces specified.
- B. Metal Work:
  1. Apply to exposed surfaces.
  2. Omit body and finish coats on surfaces concealed after installation except electrical conduit containing conductors over 600 volts.
  3. Ferrous Metal, Galvanized Metal, and Other Metals Scheduled:
    - a. Semi-Gloss (unless scheduled otherwise): Apply two (2) coats of MPI 47 (Interior Alkyd, Semi-Gloss).
      - 1) Where flat is scheduled, apply two coats of MPI 51 (Interior Alkyd, Eggshell (AK)).
      - 2) Where gloss is scheduled, apply two coats of MPI 48 (Interior Alkyd Gloss (AK)).
    - b. Machinery: One (1) coat MPI 9 (Exterior Alkyd Enamel).
    - c. Asphalt-Coated Metal: One (1) coat MPI 1 (Aluminum Paint ).
- C. Gypsum Board:
  1. Where eggshell is scheduled, apply one (1) coat of MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), plus one (1) coat of MPI 139 (Interior High Performance Latex, MPI Gloss level 3).
  2. Where flat is scheduled, apply two (2) coats of MPI 138 (Interior High Performance Latex, MPI Gloss Level 2).
  3. Where semi-gloss is scheduled, apply one (1) coat of MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), plus one (1) coat of MPI 54 (Interior Latex, Semi-Gloss, MPI Gloss Level 5).
- D. Wood:
  1. Sanding:
    - a. Use 220-grit sandpaper.
    - b. Sand sealers and varnish between coats.

- c. Sand enough to scarify surface to assure good adhesion of subsequent coats, to level roughly applied sealer and varnish, and to knock off "whiskers" of any raised grain as well as dust particles.
2. Sealers:
- a. MPI 31 (gloss) or MPI 71 (flat) thinned as recommended by manufacturer at rate of one (1) part of thinner to four (4) parts of varnish.
  - b. Apply sealers specified except sealer may be omitted where pigmented, penetrating, or wiping stains containing resins are used.
  - c. Allow manufacturer's recommended drying time before sanding, but not less than 24 hours or 36 hours in damp or muggy weather.
  - d. Sand as specified.
3. Paint Finish:
- a. Where semi-gloss is scheduled, apply one (1) coat of MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), plus one (1) coat of MPI 47 (Interior Alkyd, Semi-Gloss).
  - b. Where gloss is scheduled, apply one (1) coat of MPI 45 Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), plus one (1) coat of MPI 48 (Interior Alkyd Gloss).
  - c. Where eggshell is scheduled, apply two (2) coats of MPI 51 (Interior Alkyd, Eggshell).
4. Transparent Finishes on Wood.
- a. Natural Finish:
    - 1) One (1) coat of sealer MPI 71 (flat) thinned with thinner recommended by manufacturer at rate of one (1) part of thinner to four (4) parts of varnish.
    - 2) Two (2) coats of MPI 71 (Polyurethane, Moisture Cured, Clear Flat).
  - b. Stain Finish:
    - 1) One (1) coat of MPI 90 (Interior Wood Stain, Semi-Transparent).
    - 2) Use wood stain of type and color required to achieve finish specified. Do not use varnish type stains.
    - 3) One (1) coat of sealer MPI 71 (flat) thinned as recommended by manufacturer at rate of one (1) part of thinner to four (4) parts of varnish.
    - 4) Two (2) coats of MPI 71 (Polyurethane, Moisture Cured, Clear Flat).
  - c. Varnish Finish:

- 1) One (1) coat of sealer MPI 71 (flat) thinned as recommended by manufacturer at rate of one (1) part of thinner to four (4) parts of varnish.
- 2) Two (2) coats of MPI 71 (Polyurethane, Moisture Cured, Clear Flat).

E. Miscellaneous:

1. Apply where specified.
2. MPI 1 (Aluminum Paint): Two (2) coats of aluminum paint.

**3.10 REFINISHING EXISTING PAINTED SURFACES:**

- A. Clean, patch, and repair existing surfaces as specified under "Surface Preparation". No "telegraphing" of lines, ridges, flakes, etc., through new surfacing is permitted. Where this occurs, sand smooth and re-finish until surface meets with COR's approval.
- B. Remove and reinstall items as specified under "General Workmanship Requirements".
- C. Remove existing finishes or apply separation coats to prevent non-compatible coatings from having contact.
- D. Patched or Replaced Areas in Surfaces and Components: Apply spot-prime and body coats as specified for new work to repaired areas or replaced components.
- E. Except where scheduled for complete painting apply finish coat over plane surface to nearest break in plane, such as corner, reveal, or frame.
- F. In existing rooms and areas where alterations occur, clean existing stained and natural-finished wood, retouch abraded surfaces, and then give entire surface one (1) coat of MPI 71 (Polyurethane, Moisture Cured, Clear Flat).
- G. Refinish areas as specified for new work to match adjoining work unless specified or scheduled otherwise.
- H. Coat knots and pitch streaks showing through old finish with MPI 36 (Knot Sealer) before refinishing.
- I. Sand or dull glossy surfaces prior to painting.
- J. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.

**3.11 PAINT COLOR:**

- A. For additional requirements regarding color see Articles entitled, "REFINISHING EXISTING PAINTED SURFACE" and "MECHANICAL AND ELECTRICAL FIELD PAINTING SCHEDULE".
- B. Coat Colors:

1. Color of Priming Coat: Lighter than body coat.
2. Color of Body Coat: Lighter than finish coat.
3. Color prime and body coats to not show through the finish coat and to mask surface imperfections or contrasts.

C. Painting, Caulking, Closures, and Fillers Adjacent to Casework:

1. Paint to match color of casework where casework has a paint finish.
2. Paint to match color of wall where casework is stainless steel, plastic laminate, or varnished wood.

**3.12 MECHANICAL AND ELECTRICAL WORK FIELD-PAINTING SCHEDULE:**

- A. Field-painting of mechanical and electrical consists of cleaning, touching-up abraded shop-primed coats, and applying prime, body, and finish coats to materials and equipment if not factory-finished in space scheduled to be finished.
- B. In spaces not scheduled to be finish-painted, paint as specified below.
- C. Paint various systems specified in Division 21 - FIRE SUPPRESSION, Division 22 - PLUMBING, Division 23 - HEATING, VENTILATION AND AIR-CONDITIONING, Division 26 - ELECTRICAL, Division 27 - COMMUNICATIONS, and Division 28 - ELECTRONIC SAFETY AND SECURITY.
- D. Paint after tests have been completed.
- E. Omit prime coat from factory-prime-coated items.
- F. Finish painting of mechanical and electrical equipment is not required when located above suspended ceilings, in concealed areas such as pipe and electric closets, and furred spaces.
- G. Omit field-painting of items specified in "BUILDING AND STRUCTURAL WORK FIELD PAINTING"; "Building and Structural Work not Painted".
- H. Color:
  1. Paint items having no color specified, to match surrounding surfaces.
  2. Paint colors as specified except for following:
    - a. White: Insulation coverings on condensate piping.
    - b. Gray: Heating, ventilating, air conditioning and refrigeration equipment (except as required to match surrounding surfaces).
    - c. Federal Safety Red: Electrical conducts containing fire-alarm control wiring, and fire-alarm equipment.
- I. Apply paint systems on properly prepared and primed surface as follows:
  1. Interior Locations:
    - a. Apply two (2) coats of MPI 47 (Interior Alkyd, Semi-Gloss) to following items:

- 1) Metal under 94 degrees C (201 degrees F) of items such as bare piping, fittings, hangers, and supports.
  - 2) Equipment and systems such as hinged covers and frames for control cabinets and boxes, cast-iron radiators, electric conduits, and panel boards.
  - 3) Heating, ventilating, air-conditioning, plumbing equipment, and machinery having shop-primed coat and not factory-finished.
2. Other exposed locations:
- a. Metal surfaces, except aluminum, of cooling towers exposed to view, including connected pipes, rails, and ladders: Two (2) coats of MPI 1 (Aluminum Paint).
  - b. Cloth jackets of insulation of ducts and pipes in connection with plumbing, air-conditioning, ventilating, refrigeration, and heating systems: One (1) coat of MPI 50 (Interior Latex Primer Sealer) and one (1) coat of MPI 10 (Exterior Latex, Flat).

### **3.13 BUILDING AND STRUCTURAL WORK FIELD-PAINTING:**

- A. Painting and finishing of interior and exterior work except as specified here-in-after.
1. Painting and finishing of new and existing work including colors and gloss of finish selected.
  2. Painting of disturbed, damaged, and repaired or patched surfaces when entire space is not scheduled for complete repainting or refinishing.
  3. Painting of ferrous metal and galvanized metal.
  4. Identity painting and safety painting.
- B. Building and Structural Work not Painted:
1. Prefinished items:
    - a. Casework, doors, and similar items specified as factory-finished under other sections.
    - b. Factory-finished equipment.
  2. Finished surfaces:
    - a. Hardware except ferrous metal.
    - b. Anodized aluminum, stainless steel, chromium plating, copper, and brass, except as otherwise specified.
    - c. Signs, fixtures, and other similar items integrally finished.
  3. Concealed surfaces:
    - a. Above ceilings, except as otherwise specified.
    - b. Inside walls.

- c. Surfaces concealed behind permanently installed casework and equipment.
- 4. Moving and Operating Parts:
  - a. Mechanical and electrical operators, linkages, and sprinkler heads, and sensing devices.
  - b. Tracks for overhead or coiling doors and shutters.
- 5. Labels:
  - a. Code-required label, such as Underwriters Laboratories Inc., Intertek Testing Services, or Factory Mutual Research Corporation.
  - b. Identification plates, instruction plates, performance rating, and nomenclature.
- 6. Galvanized Metal:
  - a. Except where specifically specified to be painted.
- 7. Gaskets.
- 8. Structural steel encased in concrete or other enclosure.
- 9. Structural steel to receive sprayed-on fire proofing.

### **3.14 IDENTITY PAINTING SCHEDULE:**

- A. Identify designated service in accordance with ASME A13.1, unless specified otherwise, on exposed piping and piping above removable ceilings. For existing spaces where work is minor, match existing.
  - 1. Legend may be identified by paint stencil applications.
  - 2. Apply legends adjacent to changes in direction, on branches, where pipes pass through walls or floors, adjacent to operating accessories such as valves, regulators, strainers and cleanouts a minimum of 12.2 M (40 feet) apart on straight runs of piping. Identification next to plumbing fixtures is not required.
  - 3. Locate legends clearly visible from operating position.
  - 4. Use arrow to indicate direction of flow using black stencil paint.
  - 5. Identify pipe contents with sufficient additional details such as temperature, pressure, and contents to identify possible hazard. Insert working pressure shown on construction documents where asterisk appears for High, Medium, and Low Pressure designations as follows:
    - a. High Pressure - 414 kPa (60 psig) and above.
    - b. Medium Pressure - 104 to 413 kPa (15 to 59 psig).
    - c. Low Pressure - 103 kPa (14 psig) and below.
  - 6. Legend name in full or in abbreviated form as follows:

	COLOR OF	COLOR OF	COLOR OF	LEGEND
PIPING	EXPOSED PIPING	BACKGROUND	LETTERS	ABBREVIATIONS



Blow-off		Green	White	Blow-off
Boiler Feedwater		Green	White	Blr Feed
A/C Condenser Water Supply		Green	White	A/C Cond Wtr Sup
A/C Condenser Water Return		Green	White	A/C Cond Wtr Ret
Chilled Water Supply		Green	White	Ch. Wtr Sup
Chilled Water Return		Green	White	Ch. Wtr Ret
Shop Compressed Air		Blue	White	Shop Air
Air-Instrument Controls		Green	White	Air-Inst Cont
Drain Line		Green	White	Drain
Emergency Shower		Green	White	Emg Shower
High Pressure Steam		Green	White	H.P. _____*
High Pressure Condensate Return		Green	White	H.P. Ret _____*
Medium Pressure Steam		Green	White	M. P. Stm _____*
Medium Pressure Condensate Return		Green	White	M.P. Ret _____*
Low Pressure Steam		Green	White	L.P. Stm _____*
Low Pressure Condensate Return		Green	White	L.P. Ret _____*
High Temperature Water Supply		Green	White	H. Temp Wtr Sup
High Temperature Water Return		Green	White	H. Temp Wtr Ret
Hot Water Heating Supply		Green	White	H. W. Htg Sup
Hot Water Heating Return		Green	White	H. W. Htg Ret
Gravity Condensate Return		Green	White	Gravity Cond Ret
Pumped Condensate Return		Green	White	Pumped Cond Ret
Vacuum Condensate Return		Green	White	Vac Cond Ret
Fuel Oil - Grade // //		Brown	White	Fuel Oil-Grade // //
(Diesel Fuel included under Fuel Oil)				
Boiler Water Sampling		Green	White	Sample
Chemical Feed		Green	White	Chem Feed
Continuous Blow-Down		Green	White	Cont. B D
Pumped Condensate		Green	White	Pump Cond
Pump Recirculating		Green	White	Pump-Recirc.
Vent Line		Green	White	Vent
Alkali		Orange	Black	Alk
Bleach		Orange	Black	Bleach
Detergent		Yellow	Black	Det
Liquid Supply		Yellow	Black	Liq Sup
Reuse Water		Yellow	Black	Reuse Wtr
Cold Water (Domestic)	White	Green	White	C.W. Dom
Hot Water (Domestic)				
Supply	White	Yellow	Black	H.W. Dom
Return	White	Yellow	Black	H.W. Dom Ret
Tempered Water	White	Yellow	Black	Temp. Wtr
Ice Water				
Supply	White	Green	White	Ice Wtr

Return	White	Green	White	Ice Wtr Ret
Reagent Grade Water		Green	White	RG
Reverse Osmosis		Green	White	RO
Sanitary Waste		Green	White	San Waste
Sanitary Vent		Green	White	San Vent
Storm Drainage		Green	White	St Drain
Pump Drainage		Green	White	Pump Disch
Chemical Resistant Pipe				
Waste		Orange	Black	Acid Waste
Vent		Orange	Black	Acid Vent
Atmospheric Vent		Green	White	ATV
Silver Recovery		Green	White	Silver Rec
Oral Evacuation		Green	White	Oral Evac
Fuel Gas		Yellow	Black	Gas
Fire Protection Water				
Sprinkler		Red	White	Auto Spr
Standpipe		Red	White	Stand
Sprinkler		Red	White	Drain

7. See Sections for methods of identification, legends, and abbreviations of the following:

- a. Regular compressed air lines: Section 22 15 00, GENERAL SERVICE COMPRESSED-AIR SYSTEMS.
- b. Laboratory gas and vacuum lines: Section 22 62 00, VACUUM SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES / Section 22 63 00, GAS SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES.
- c. Medical Gases and vacuum lines: Section 22 62 00, VACUUM SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES / Section 22 63 00, GAS SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES.

**B. Fire and Smoke Partitions:**

1. Identify partitions above ceilings on both sides of partitions except within shafts in letters not less than 64 mm (2 1/2 inches) high.
2. Stenciled message: "SMOKE BARRIER" or, "FIRE BARRIER" as applicable.
3. Locate not more than 6096 mm (20 feet) on center on corridor sides of partitions, and with a least one (1) message per room on room side of partition.
4. Use semi-gloss paint of color that contrasts with color of substrate.

**3.15 PROTECTION CLEAN UP, AND TOUCH-UP:**

- A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.

- B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted.
- C. Before final inspection, touch-up or refinish in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

- - - E N D - - -



**SECTION 10 14 00  
SIGNAGE**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies interior signage for room numbers, directional signs, code-required signs, and temporary signs.
  - 1. Signage proposed for this Project shall:
    - a. Function as described in this Section and in the VA Mountain Home Sign Standard Drawings.
    - b. Match exact finishes and sizes of signs designed and specified for this Project and approved by the Department of Veterans Affairs (VA).
    - c. Be in line with the VAMC's continuing effort to move patients more efficiently throughout the hospital reducing stress on both patients and staff while increasing hospital efficiencies.

**1.2 RELATED WORK:**

- A. Lighted EXIT signs for egress purposes are specified under Division 26, ELECTRICAL.

**1.3 QUALITY ASSURANCE:**

- A. Project requires a combined environmental graphics design-build organization with significant experience in developing a large-scale interior signage/wayfinding scheme in a major medical center environment.
- B. Manufacturer's Qualifications: Provide signage that is the product of one manufacturer. Submit evidence of satisfying the following qualifications.
  - 1. Sign manufacturer shall have provided signage as specified for a minimum of three (3) years.
  - 2. Signs shall be manufactured in the United States of America.
  - 3. Signage shall be available from manufacturer under standard GSA warranties.
- C. Installer's Qualifications: Minimum three (3) years' experience in the installation of signage of the type as specified in this Section. Submit installer's qualifications.

**1.4 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 00, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Each submittal shall include:
  - 1. Name of Project.

2. Sign Contractor's name.
  3. Date submitted.
- B. Sustainable Design Submittals, as described below:
1. Certification of composite board back plate as an Environmentally Preferable Purchasing (EPP) downstream product.
- C. Interior Sign Samples: Sign panels and frames, with letters and symbols, for each sign type.
1. Sign Panel, 203 x 254 mm (8 x 10 inches), with letters.
  2. Color samples of each color, 152 x 152 mm (6 x 6 inches). Show anticipated range of color and texture.
  3. Sample of typeface, arrow, and symbols in a typical full-size layout.
- D. Manufacturer's Literature:
1. Showing the methods and procedures proposed for the anchorage of the signage system to each surface type.
  2. Manufacturer's printed specifications and installation and maintenance instructions.
- E. Delegated Design Submittal: Full report documenting general wayfinding theory, themes, and plan.
1. Sign Message Schedule.
  2. Sign Location Plan(s), showing location, type, and total number of signs required.
- F. Shop Drawings: Scaled for manufacture and fabrication of sign types. Identify materials, show joints, welds, anchorage, accessory items, mounting, and finishes.
- G. Full size layout patterns for dimensional letters.
- H. Manufacturer's qualifications.
- I. Installer's qualifications.
- 1.5 DELIVERY AND STORAGE:**
- A. Deliver materials to job in manufacturer's original sealed containers with brand name marked thereon. Protect materials from damage.
  - B. Package to prevent damage or deterioration during shipment, handling, storage, and installation. Maintain protective covering in place and in good repair until removal is necessary.
  - C. Deliver signs only when the Project site and mounting services are ready for installation work to proceed.
  - D. Store products in dry condition inside enclosed facilities.
  - E. Protect products against damage during field-handling and installation.

**1.6 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".
- B. The Sign Contractor, by commencing the work of this Section, assumes overall responsibility, as part of the Contractor's warranty of work, to assure that assemblies, components, and parts shown or required within the work of this Section, comply with the Contract Documents. The Contractor shall further warrant ~~that~~ that all components, specified or required to satisfactorily complete the installation are compatible with each other and with conditions of installations.

**1.7 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. ASTM International (ASTM):
  - B221-14.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
  - B221M-13.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes (Metric)
- C. Federal Specifications (Fed Spec):
  - MIL-PRF-8184F.....Plastic Sheet, Acrylic, Modified.
  - MIL-P-46144C.....Plastic Sheet, Polycarbonate
- D. United States Department of Justice (USDoJ): 2010 ADA Standards for Accessible Design, September 15, 2010.

**1.8 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate proposed signage with the VA according to facility demolition, renovation, and construction schedules.

**PART 2 - PRODUCTS****2.0 MANUFACTURERS**

- A. Provide items as completed units produced by a single manufacturer. Specified Vendor (Joint Venture):
  - 1. Creative Signage System, Inc. 9101 51<sup>st</sup> Place College Park, MD 20740  
P: 301-345-3700 E: [creative@creativesignage.com](mailto:creative@creativesignage.com).
  - 2. Sayres and Associates, 55 M St., SE, Suite 200, Washington, D.C. 20003 P: 202-355-0922 Extension 2109.

**2.1 SIGNAGE GENERAL:**

- A. Provide signs of type, size, and design shown on the Construction Documents.

- B. Provide signs complete with lettering, framing, and related components for a complete installation.
- C. Provide graphic items as completed units, including necessary mounting accessories, fittings, and fastenings.
- D. Do not scale Construction Documents for dimensions. Verify dimensions and coordinate with field conditions. Notify Contracting Officer Representative (COR) of discrepancies or changes needed to satisfy the requirements of the Construction Documents.
- E. Components shall be made to complement the architecture and interior design themes currently being initiated using signage standards already designed and implemented (see VA Mountain Home Sign Standard Drawings). New and modified components shall be oriented around current design themes.
- F. Proposed products shall be non-proprietary items on GSA Schedule and readily available in the commercial market for ease in future procurement.

## **2.2 EXTERIOR SIGNAGE PERFORMANCE REQUIREMENTS (NOT USED)**

## **2.3 INTERIOR SIGN MATERIALS:**

- A. Aluminum:
  - 1. Extrusions and Tubing: ASTM B221M (ASTM B221).
  - 2. Recycled Content: 75 percent.**
- B. Cast Acrylic Sheet: MIL-PRF-8184F; Type II, class 1, Water white non-glare optically clear. Matte-finished water white clear acrylic shall not be acceptable.
- C. Adhesives:
  - 1. Adhesive for Shop-Laminating Faceplate to Back Plate: Sta'-Put S200 High Strength Aerosol Adhesive by ITW Polymers Sealants North America.
    - a. Shear strength, tack-resistance, and heat-resistance shall exceed that of pressure-sensitive adhesives.
  - 2. Adhesive for Shop-Assembly of Aluminum Frame: Two-part epoxy.

## **2.4 EXTERIOR SIGN MATERIALS (NOT USED)**

## **2.5 INTERIOR SIGN TYPES (STANDARDS / CONSTRUCTION)**

- A. The proposed interior signage shall meet federal, state, local, and VA requirements for safety and ADA compliance.
- B. Conform to the VA Signage Design Guide (<http://www.cfm.va.gov/til/spclRqmts.asp#SIGN>).
- C. Specifications Applicable to Signs in General:



1. Type Styles: Optima, Arial Bold, and Arial as indicated on the VA Mountain Home Sign Standard Drawings. Initial caps or all caps, as indicated in Sign Message Schedule.
2. Arrow: Comply with graphic standards in Construction Documents.
3. Letter spacing: Comply with graphic standards in Construction Documents.
4. Provide text, arrows, and symbols in size, colors, typefaces, and letter spacing shown in Construction Documents. Text shall be a true, clean, accurate reproduction of typeface(s) shown. Text shown in Construction Documents is for layout purposes only; final text for signs is listed in Sign Message Schedule.
5. Finish and Contrast: Characters and background shall be eggshell, matte, or other non-glare finish and shall exhibit adequate contrast. Refer to the VA Mountain Home Sign Standard Drawings. Background shall be off-white acrylic. Match function and design of signs designed and specified for this Project and approved by the VA.
6. Interior signs shall be composed of a two-ply 1/16-inch-thick matte faceplate laminated to 1/8-inch-thick clear back plate with compound high-strength aerosol adhesive.
6. Signs shall nest into a 1/4-inch-thick back-plate with wood laminate and two 1/8-inch by 9-inch integral anodized-aluminum rails.
  - a. **Composite back-plate shall be made of recycled content and be third-party certified as an Environmental Preferable Purchasing (EPP) downstream product** (to comply with the environmental criteria referenced in the USEPA's guidelines for environmentally preferable purchasing).
7. Signs / pockets shall be magnetically mounted to back-plate and nested between aluminum bars.
8. Create pocket signs using No. 38 (0.080-inch) separating rib(s) to form insert space for custom computer-generated acetate with package results in 5-3/16-inch inserts and 2-1/16-inch inserts (**the use of adhesive strips instead of acrylic ribs is not acceptable**).
9. Where indicated, signs shall nest into a Type-OS22 [?] custom-extruded, precision-mitered frame composed of clear-anodized **aluminum**. Assemble frame using two-part epoxy using back-plate made of composite board with recycled content.

10. Use injection-molded acrylonitrile butadiene styrene (ABS) characters for the room number portion of the [\_\_\_\_\_] sign.
  11. **Sign Color and Non-ADA Copy/Graphics: Subsurface-applied.**
    - a. **Surface color or copy including laminates will not be acceptable.**
    - b. Subsurface screen inks shall be equal to NAZ-DAR Industrial Lacquer #7200 -series with 2-Propoxyethanol CAS # 2807-30-9; 2-Butoxyethanol CAS # 111-76-2; Isopropyl Alcohol CAS # 67-63-0; Toluene CAS#108-88-3 and shall match #6213 Jade with black text (HM).
  12. Signage shall be accompanied by a software program with unlimited licenses that automatically scales the copy for the insert to fit each sign appropriately allowing signs to be updated in-house on any standard computer and printer while maintaining sign standards.
- D. Permanent Rooms and Spaces:
1. Characters shall be accompanied by Grade-2 Braille.
    - a. Produce Grade-2 Braille with high-pressure surface beading directly below tactile number (3/16-inch clear minimum). Braille translation shall utilize Duxbury Braille translator.
  2. Tactile numbers, letters, and Braille characters, when required, shall be raised a minimum of 0.8 mm (1/32 inches) from the background surface.
  3. Minimum Character Height: 16 mm (5/8 inch).
  4. Maximum Character Height: 50 mm (2 inches).
  5. Symbols (Pictograms): Equivalent written description shall be placed directly below symbol, outside of symbol's background field. Border dimensions of symbol background shall be minimum 150 mm (6 in) high.
  6. Identifications Signs:
    - a. Size: 6-inch by 9-inch.
    - b. Font: Optima in black.
    - c. Background: Off white.
    - d. Finish and Contrast: Signs shall match function and design of signs designed and specified for this Project.
- E. Overhead Signs: Refer to VA Mountain Home Sign Standard Drawings.
1. Characters shall have a width-to-height ratio between 3:5 and 1:1.
  2. Characters shall have a stroke width-to-height ratio of between 1:5 and 1:10.
  3. Character Height: Minimum 75 mm (3 in) high for overhead signs. As shown, for directional signs.

4. Finish and Contrast: Signs shall match function and design of signs designed and specified for this Project.

5. Signs to have a solid wood accent.

**F. Dimensional Letters and Numbers:**

1. Provide dimensional letters and numbers that are cut-out aluminum in size and thickness indicated in construction documents.
2. Provide draft of letters perpendicular to letters face.
3. Fabricate letters with square corners, such as where a letter stem and bar intersect.
4. Paint letters with baked enamel.

**2.6 EXTERIOR SIGN TYPES (NOT USED)**

**2.7 FABRICATION:**

- A. Design interior signage components to allow for expansion and contraction for a minimum material temperature range of 56 degrees C (100 degrees F), without causing buckling, excessive opening of joints, or over-stressing of adhesives, welds, and fasteners.
- B. Form work to required shapes and sizes, with true curved lines and angles. Provide necessary rebates, lugs, and brackets for assembly of units. Provide concealed fasteners wherever possible.
- C. Shop-fabricate so far as practicable. Fasten joints flush to conceal reinforcement, or weld joints, where thickness or section permits.
- D. Level and assemble contact surfaces of connected members so joints will be tight and practically unnoticeable, without applying filling compound.
- E. Signs: Fabricate with fine, even texture. Signs shall be flat and sound.
  1. Maintain lines and miters sharp, arises unbroken, profiles accurate, and ornament true to pattern.
  2. Plane surfaces shall be smooth, flat, and without oil-canning, free of rack and twist.
  3. Maximum Variation from Plane of Surface: Plus-or-minus 0.3 mm (0.015 inches). Restore texture to filed or cut areas.
- F. Finish extruded members shall be free from extrusion marks. Fabricate with square turns, sharp corners, and true curves.
- G. Finish hollow signs with matching material on all faces, tops, bottoms, and ends. Miter edge joints to give appearance of solid material.

- H. Do not manufacture signs until final review of Sign Message Schedule and Sign Location Plan(s) has been completed by the COR and forwarded to Contractor.
- I. Drill holes for bolts and screws. Mill smooth exposed ends and edges with corners slightly rounded.
- J. Movable Parts, Including Hardware: Clean and adjust to operate as designed without binding or deformation of members. Center doors and covers in opening or frame.
  - 1. Align contact surfaces to fit tight and even without forcing or warping components.
- K. Pre-assemble items in shop to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.
- L. Prime-paint surfaces as required. Apply finish coating of paint for complete coverage with no light or thin applications allowing substrate or primer to show.
  - 1. Finish surface smooth, free of scratches, gouges, drips, bubbles, thickness variations, foreign matter, and other imperfections.

### **PART 3 - EXECUTION**

#### **3.0 PREPARATION**

- A. Protect adjacent existing and newly placed construction and finishes as much as possible during installation to limit wall damage.

#### **3.1 INSTALLATION:**

- A. Locate signs as shown on the Construction Documents and the Sign Location Plan(s).
- B. Conform to the VA Signage Design Guide (<http://www.cfm.va.gov/til/spclRqmts.asp#SIGN>) for installation requirements.
- C. At each sign location verify that there are no utility lines behind each sign location that will be affected by installation of signs.
  - 1. Correct and repair damage done to utilities during installation of signs at no additional cost to Government.
- D. Provide inserts and anchoring devices that are required to be set in concrete or other material for installation of signs. Submit setting drawings, templates, instructions, and directions for installation of anchorage devices that might involve other trades.

- E. Refer to Sign Message Schedule for mounting method. Mount signs in proper alignment, level and plumb, according to the Sign Location Plan(s) and the dimensions given on the elevation drawings. When exact position, angle, height, or location is not clear, contact COR for resolution.
1. Wall-mounted signs shall be mechanically fastened to the wall with concealed screws and plugs.
- F. When signs are installed on glass, provide blank glass back-up to be placed on opposite side of glass exactly behind sign being installed. Provide blank glass back that is the same size as sign being installed.
- G. Touch-up exposed fasteners and connecting hardware to match color and finish of surrounding surface.
- H. At completion of sign installation, clean exposed sign surfaces. Clean and repair adjoining or adjacent surfaces that became soiled or damaged as a result of installation of signs.

- - - END - - -



**SECTION 10 22 39**  
**FOLDING PANEL PARTITIONS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Folding-panel partitions.
- B. Related Sections include the following:
  - 1. Section 05 50 00 - Metal Fabrications: Structural support fabricated per folding-panel partition supplier's template.
  - 2. Section 06 10 00 - Rough Carpentry: Wood framing and supports, and all blocking at head and jambs as required.
  - 3. Section 09 22 16 - Non-Structural Metal Framing: Wall and ceiling framing at head and jambs.
  - 4. Section 09 90 00 - Painting: Field-applied finishes.

**1.02 REFERENCE STANDARDS**

- A. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- B. ASTM E413 - Classification for Rating Sound Insulation.
- C. ASTM E557 - Standard Guide for the Installation of Operable Partitions.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting:
  - 1. Comply with Section 01 30 00 - Administrative Requirements.
  - 2. Invite parties affected by work of this Section.
  - 3. Discuss scheduling, sequence of activities, and coordination.
- B. Sequencing: To protect panels against damage, install folding-panel partitions and accessories after other finishing operations -- including painting -- have been completed

**1.04 SUBMITTALS**

- A. Comply with Section 01 30 00 - Administrative Requirements.
- B. Product Data: Furnish folding-panel partition material and assembly descriptions, construction details, finishes, installation details, and operating instructions for each type of folding-panel partition, component, and accessory specified.
- C. Shop Drawings: Show location and extent of folding-panel partitions. Include plans, elevations, sections, details, attachments to other construction, and accessories. Indicate dimensions, weights, conditions at openings and storage areas, and required installation, storage, and operating clearances. Indicate location and installation requirements for hardware and track, including floor tolerances required and direction of travel. Indicate blocking to be provided under other sections and coordination with adjacent work.
- D. Setting Drawings: Show cutouts required in other work, including support beam punching template.
  - 1. Provide required installation numbering system for each panel and component.
- E. Samples:
  - 1. Samples for Selection: Furnish color samples demonstrating full range of finishes available for selection by the Architect.
  - 2. Samples for Verification: Submit in same thickness and material indicated for the work.

- 3. Submit samples for:
  - a. Panel finishes (both opaque and translucent materials).
  - b. Metal track.
  - c. Edge trim.
  - d. Accessories.
- F. Certificates: Installer certification from manufacturer.
- G. Test Report: Provide written test report showing compliance with specified acoustical performance.

#### **1.05 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit manufacturer's operation and maintenance instructions.
- B. Warranty Documentation: Submit sample of manufacturer's warranty.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with Section 01 40 00 - Quality Requirements.
- B. Installer Qualifications: Certified by the folding-panel partition manufacturer.
  - 1. As qualified to install the manufacturer's partition systems.
  - 2. As experienced in successful work similar in material, design, and extent to that indicated for this Project.
- C. Acoustical Performance: Test folding-panel partitions in an independent acoustical laboratory in accordance with ASTM E90 test procedure to attain no less than the Sound Transmission Class (STC) specified when classified in accordance with ASTM E413. Provide a complete and unedited written test report.

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

- A. Clearly mark packages and panels with numbering systems used on Shop Drawings. Do not use permanent markings on surfaces that will be visible after installation.
- B. Protect panels during delivery, storage, and handling to comply with manufacturer's direction and as required to prevent damage.

#### **1.08 FIELD CONDITIONS**

- A. Do not begin installation until permanent HVAC systems are properly operating and building temperature and humidity have stabilized.

#### **1.09 WARRANTY**

- A. Comply with Section 01 78 00 - Closeout Submittals.
- B. Provide written warranty by manufacturer of folding-panel partitions agreeing to repair or replace any components with manufacturing defects.
- C. Warranty Period: Two years.

### **PART 2 - PRODUCTS**

#### **2.01 OPERATION**

- A. Partitions shall consist of a series of individual flat panels that are top-supported, manually operated, and sealed by top and bottom seals and an expanding jamb.

#### **2.02 WALL PANEL CONSTRUCTION**

- A. Opaque Steel-Framed Panels:
  - 1. Description: Series of individual flat panels, manually operated, top-supported with operable floor seals.
    - a. Final Closure: Horizontally expanding panel edge with removable crank.



2. Panel Construction:
  - a. Nominal 3-inch (76 mm) thick panels in manufacturer's standard 48-inch (1220 mm) widths. All panel horizontal and vertical framing members fabricated from minimum 18-gage formed steel with overlapped and welded corners for rigidity. Top channel is reinforced to support suspension system components. Frame is designed so that full vertical edges of panels are of formed steel and provide concealed protection of the edges of the panel skin.
  - b. Panel Skin:
    - 1) Steel-Faced Gypsum Board: 22-gage steel on 1/2-inch-thick gypsum board. Single material or composite layers continuously bonded to panel frame.
      - (a) Interior Finish Class: A.
      - (b) Sound Transmission Class (STC): Minimum of 50 when tested in accordance with ASTM E90 and classified in accordance with ASTM E413.
  - c. Hinges for Closure Panels: Full-leaf butt hinges, attached directly to panel frame with welded hinge anchor plates within panel to further support hinge mounting to frame.
    - 1) Lifetime warranty on hinges.
    - 2) Hinges mounted into panel edge or vertical astragal will not be acceptable.
  - d. Panel Weights: Eight and one-half pounds per square foot.
  - e. Panel Finishes: Customer's own material (subject to factory approval).
    - 1) Color of Finish: See Finish Legend on the Drawings or VA-approved equivalent.
  - f. Panel Trim: No vertical trim required or allowed on edges of panels; minimal groove appearance at panel joints.
3. Sound Seals:
  - a. Vertical Interlocking Sound Seals between Panels: Roll-formed steel astragals, with reversible tongue-and-groove configuration in each panel edge for universal panel operation. Rigid plastic astragals or astragals in only one panel edge will not be acceptable.
  - b. Horizontal Top Seals: Continuous-contact extruded vinyl bulb shape with pairs of non-contacting vinyl fingers to prevent distortion without the need for mechanically operated parts.
  - c. Horizontal Bottom Seal: Automatic operable seals providing nominal 2-inch operating clearance with an operating range of plus 1/2-inch to minus 1-1/2 inch which automatically drop as panels are positioned, without the need for tools or cranks.

### 2.03 SUSPENSION SYSTEM

- A. Roll-Formed Steel Track.
  1. Minimum Thickness: 0.18 inch (fka 7 gage).
  2. Finish: Clear steel finish.
  3. Structural Supports: Adjustable steel hanger brackets connected to structural support by pairs of 1/2-inch-diameter threaded rods. Brackets must support load-bearing surface of track.
    - a. Static loading of track with brackets at 48-inch centers shall show no failure of track or brackets at 5,000 pounds point loading at mid-span.
  4. Soffit: Steel, removable for service and maintenance, attached to track bracket with exposed fasteners, and pre-painted off-white.
  5. Carriers: Metal trolleys with four steel tires. Non-steel tires will not be acceptable.

**PART 3 - EXECUTION****3.01 EXAMINATION**

- A. With Installer present, examine flooring, structural support, and opening for compliance with requirements for installation tolerances and other conditions affecting performance of folding-panel partitions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 PREPARATION**

- A. Preparation of the opening shall conform to the criteria set forth in ASTM E557.

**3.03 INSTALLATION**

- A. General: Comply with ASTM E557, folding-panel-partition manufacturer's written installation instructions, Drawings, and approved Shop Drawings.
- B. Match folding-panel partitions by installing panels from marked packages in numbered sequence indicated on Shop Drawings.
- C. Broken, cracked, chipped, deformed or unmatched panels will not be acceptable.

**3.04 ADJUSTING**

- A. Adjust folding-panel partitions to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction throughout entire operational range. Lubricate hardware and other moving parts.

**3.05 CLEANING**

- A. Clean partition surfaces upon completing installation of folding-panel partitions to remove dust, dirt, adhesives, and other foreign materials according to manufacturer's written instructions.

**3.06 DEMONSTRATION**

- A. Demonstrate proper operation and maintenance procedures to Owner's representative. Comply with Section 01 79 00 - Demonstration and Training.

**3.07 PROTECTION**

- A. Provide final protection and maintain conditions in a manner acceptable to the manufacturer and Installer that ensure folding-panel partitions are without damage or deterioration at time of Substantial Completion.

**END OF SECTION**

**SECTION 10 26 00  
WALL AND DOOR PROTECTION**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies handrail/wall guard combination, corner guards and chair rails.

**1.2 RELATED WORK:**

- A. Armor plates and kick plates not specified in this Section:  
Section 08 71 00, DOOR HARDWARE.

**1.3 QUALITY ASSURANCE:**

- A. Manufacturer's Qualifications: Manufacturer with a minimum of three (3) years' experience in providing items of type specified.
  - 1. Obtain wall protection from single manufacturer.
- B. Installer's Qualifications: Installers are to have a minimum of three (3) years' experience in the installation of units required for this Project.

**1.4 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Show design and installation details.
- C. Manufacturer's Literature and Data:
  - 1. Handrail/Wall Guard Combination.
  - 2. Corner Guards.
  - 3. Chair Rails.
- D. Test Report: Showing that resilient material complies with specified fire and safety code requirements.
- E. Manufacturer's qualifications.
- F. Installer's qualifications.
- G. Manufacturer's warranty.

**1.5 DELIVERY AND STORAGE:**

- A. Deliver materials to the Project site in original sealed packages or containers marked with the name and brand, or trademark of the manufacturer.
- B. Protect from damage from handling and construction operations before, during, and after installation.
- C. Store in a dry environment of approximately 21 degrees C (70 degrees F) for at least 48 hours prior to installation.

**1.6 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their wall protection for a minimum of five (5) years from date of installation and final acceptance by the Government. Submit manufacturer warranty.

**1.7 APPLICABLE PUBLICATIONS:**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. ASTM International (ASTM):
  - B221-14.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
  - B221M-13.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes (Metric)
  - D256-10.....Impact Resistance of Plastics
  - D635-10.....Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
  - E84-14.....Surface Burning Characteristics of Building Materials
- C. Aluminum Association (AA):
  - DAF 45-09.....Designation System for Aluminum Finishes
- D. Code of Federal Regulation (CFR):
  - 40 CFR 59.....Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coating
- E. The National Association of Architectural Metal Manufacturers (NAAMM):
  - AMP 500-06.....Metal Finishes Manual
- F. SAE International (SAE):
  - J 1545-05(R2014).....Instrumental Color Difference Measurement for Exterior Finishes.
- G. Underwriters Laboratories Inc. (UL):
  - Annual Issue.....Building Materials Directory

**PART 2 - PRODUCTS****2.1 MATERIALS:**

- A. Aluminum Extruded: ASTM B221M (B221), Alloy 6063, Temper T5 or T6.
- B. Resilient Material:

1. Provide resilient material consisting of high-impact-resistant extruded acrylic vinyl, polyvinyl chloride, or injection-molded thermal plastic conforming to the following:
  - a. Minimum impact resistance of 960.8 N-m/m (18 ft.-lbs./sq. inch) when tested in accordance with ASTM D256 (Izod impact, ft.-lbs. per inch notched).
  - b. Class 1 fireresistance rating when tested in accordance with ASTM E84, having a maximum flame spread of 25 and a smoke developed rating of 450 or less.
  - c. Rated self-extinguishing when tested in accordance with ASTM D635.
  - d. Provide material labeled and tested by Underwriters Laboratories or other approved independent testing laboratory.
  - e. Provide integral color with colored components matched in accordance with SAE J 1545 to within plus-or-minus 1.0 on the CIE-LCH scales.

## **2.2 CORNER GUARDS:**

- A. Resilient, Shock-Absorbing Corner Guards: Surface-mounted type.
  1. Snap-on corner guard formed from resilient material, minimum 1.98 mm (0.078-inch) thick, free-floating on a continuous 1.52 mm (0.060-inch) thick extruded-aluminum retainer. Provide appropriate mounting hardware, cushions, and base plates as required.
  2. Profile: Minimum 76 mm (3 inch) long leg and 6 mm (1/4 inch) corner radius.
  3. Height: As indicated.
  4. Retainer Clips: Provide manufacturer's standard impact-absorbing clips.
  5. Provide factory-fabricated end closure caps at top and bottom of surface mounted corner guards.

## **2.3 HANDRAILS:**

- A. Resilient Handrails:
  1. Handrail/Wall Guard Combination:
    - a. Snap-on covers of resilient material, minimum 1.98 mm (0.078-inch) thick.
    - b. Free-floating on a continuous, extruded-aluminum retainer, minimum 1.82 mm (0.072-inch) thick.
    - c. Anchor to wall at maximum 762 mm (30 inches) on center.

2. Provide handrails with prefabricated end closure caps, inside and outside corners, concealed splices, cushions, mounting hardware, and other accessories as required. End caps and corners to be field-adjustable to assure close alignment with handrails. Screw or bolt closure caps to aluminum retainer in a concealed manner.

### **2.3A CHAIR RAILS**

- A. Height: 2-1/8 inches.
- B. Projection from Wall: 1-1/8 inches.
- C. Locked-in-place covers of resilient material with resistant pebble-grain texture, nominal 1.5 mm (0.060-inch) thick.
- D. Free-floating on a continuous, extruded-aluminum retainer, nominal 2 mm (0.080-inch) thick.
- E. Provide matching prefabricated end closure caps, inside and outside corners, concealed splices, mounting hardware, and other accessories as required. End caps and corners to be field-adjustable to assure close alignment with chair rails. Screw or bolt closure caps to aluminum retainer in a concealed manner.

### **2.4 DOOR AND DOOR FRAME PROTECTION (NOT USED)**

### **2.5 HIGH IMPACT WALL COVERING (NOT USED)**

### **2.6 FASTENERS AND ANCHORS:**

- A. Provide fasteners and anchors as required for each specific type of installation.
- B. Where type, size, spacing, or method of fastening is not shown or specified in Construction Documents, submit Shop Drawings showing proposed installation details.

### **2.7 FINISH:**

- A. Aluminum: In accordance with AA DAF-45.
  1. Mill finish as fabricated, uniform in color and free from surface blemishes.
- B. Resilient Material: Embossed textures and color in accordance with SAE J1545.

## **PART 3 - INSTALLATION**

### **3.0 EXAMINATION**

- A. Examine areas and conditions in which the wall protection materials will be installed.
  1. Complete all finishing operations, including painting, before beginning installation of wall protection materials.
  2. Clean substrate to remove dust, debris, and loose particles.

B. Wall surface shall be dry and free from dirt, grease, and loose paint.

**3.1 RESILIENT CORNER GUARDS:**

A. Install corner guards on walls in accordance with manufacturer's instructions.

**3.2 STAINLESS STEEL CORNER GUARDS (NOT USED)**

**3.3 RESILIENT WALL GUARD HANDRAIL COMBINATION**

A. Secure guards to walls with mounting cushions, brackets, and fasteners in accordance with manufacturer's details and instructions.

**3.3A CHAIR RAILS**

- A. Install chair rail to walls securely in accordance with manufacturer's written instructions.
- B. Install chair rails accurately in location, alignment, and elevation.
- C. Provide horizontal steel-stud back-up in stud cavity to accept fasteners.

**3.4 ALUMINUM WALL GUARDS (NOT USED)**

**3.5 STAINLESS STEEL WALL GUARDS (NOT USED)**

**3.6 DOOR, DOOR FRAME PROTECTION AND HIGH IMPACT WALL COVERING (NOT USED)**

**3.7 CLEANING**

A. At completion of the installation, clean surfaces in accordance with the manufacturer's clean-up and maintenance instructions.

- - - E N D - - -





**SECTION 10 28 00**  
**TOILET, BATH, AND LAUNDRY ACCESSORIES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies manufactured items usually used in dressing rooms, toilets, baths, locker rooms and at sinks in related spaces.
- B. Items Specified:
  - 1. Paper towel dispenser.
  - 2. Paper towel dispenser with integrated trash can.
  - 3. Waste container.
  - 4. Toilet paper dispenser.
  - 5. Grab bars.
  - 6. Hooks (robe or purse).
  - 7. Metal-framed mirror.
  - 8. Soap dispenser.
- B. This Section also specifies custom-fabricated items used in toilets and related spaces.

**1.2 RELATED WORK**

- A. Color of finishes: Section 09 06 00, SCHEDULE FOR FINISHES
- B. Color of vinyl fabric: Section 09 06 00, SCHEDULE FOR FINISHES.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings:
  - 1. Each product specified.
  - 2. Paper towel dispenser and combination dispenser and disposal units.
  - 3. Metal framed mirrors.
  - 4. Shower curtain rods, showing required length for each location.
  - 5. Grab bars, showing design and each different type of anchorage.
  - 6. Soap dispenser, showing anchorage and components.
- C. Samples:
  - 1. One of each type of accessory specified.
  - 2. After approval, samples may be used in the work.
- D. Manufacturer's Literature and Data:
  - 1. All accessories specified.
  - 2. Show type of material, gages or metal thickness in inches, finishes, and when required, capacity of accessories.
  - 3. Show working operations of spindle for toilet tissue dispensers.

E. Manufacturer's Certificates:

1. Attesting that soap dispensers are fabricated of material that will not be affected by liquid soap or aseptic detergents, PhisoHex, and solutions containing hexachlorophene.
2. Anodized finish as specified.

**1.4 QUALITY ASSURANCE**

- A. Each product shall meet, as a minimum, the requirements specified, and shall be a standard commercial product of a manufacturer regularly presently manufacturing items of type specified.
- B. Each accessory type shall be the same and be made by the same manufacturer.
- C. Each accessory shall be assembled to the greatest extent possible before delivery to the Project site.
- D. Include additional features, which are not specifically prohibited by this specification, but which are a part of the manufacturer's standard commercial product.

**1.5 PACKAGING AND DELIVERY**

- A. Pack accessories individually to protect finish.
- B. Deliver accessories to the project only when installation work in rooms is ready to receive them.
- C. Deliver inserts and rough-in frames to Project site at appropriate time for building-in.
- D. Deliver products to Project site in sealed packages of containers; labeled for identification with manufacturer's name, brand, and contents.

**1.6 STORAGE**

- A. Store products in weathertight and dry storage facility.
- B. Protect from damage from handling, weather, and construction operations before, during, and after installation in accordance with manufacturer's instructions.

**1.7 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
  - A167-99(R2009).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
  - A176-99(R2009).....Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip

- A269-10.....Seamless and Welded Austenitic Stainless Steel  
Tubing for General Service
- A312/A312M-09.....Seamless and Welded Austenitic Stainless Steel  
Pipes
- A653/A653M-10.....Steel Sheet, Zinc-Coated (Galvanized) or Zinc-  
Iron Alloy-Coated (Galvannealed) by the Hot-Dip  
Process
- B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods,  
Wire, Shapes, and Tubes
- B456-03(R2009).....Electrodeposited Coatings of Copper Plus Nickel  
Plus Chromium and Nickel Plus Chromium
- C1036-06.....Flat Glass
- C1048-04.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated  
and Uncoated Glass
- D635-10.....Rate of Burning and/or Extent and Time of  
Burning of Self Supporting Plastics in a  
Horizontal Position
- F446-85(R2009).....Consumer Safety Specification for Grab Bars and  
Accessories Installed in the Bathing Area.
- D3453-07.....Flexible Cellular Materials - Urethane for  
Furniture and Automotive Cushioning, Bedding,  
and Similar Applications
- D3690-02(R2009).....Vinyl-Coated and Urethane-Coated Upholstery  
Fabrics - Indoor
- C. The National Association of Architectural Metal Manufacturers (NAAMM):  
AMP 500 Series.....Metal Finishes Manual
- D. American Welding Society (AWS):  
D10.4-86 (R2000).....Welding Austenitic Chromium-Nickel Stainless  
Steel Piping and Tubing
- E. Federal Specifications (Fed. Specs.):  
A-A-3002.....Mirrors, Glass  
FF-S-107C (2).....Screw, Tapping and Drive  
WW-P-541E(1).....Plumbing Fixtures (General Specification)

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Aluminum: ASTM B221, alloy 6063-T5 and alloy 6463-T5.
- B. Stainless Steel:
1. Plate or sheet: ASTM A167, Type 302, 304, or 304L, except ASTM A176 where Type 430 is specified, 0.0299-inch thick unless otherwise specified.
  2. Tube: ASTM A269, Alloy Type 302, 304, or 304L.

- C. Stainless Steel Tubing: ASTM A269, Grade 304 or 304L, seamless or welded.
- D. Stainless Steel Pipe: ASTM A312; Grade TP 304 or TP 304L.
- E. Steel Sheet: ASTM A653, zinc-coated (galvanized) coating designation G90.
- F. Glass:
  - 1. ASTM C1036, Type 1, Class 1, Quality q2, for mirrors.
- G. Foam Rubber: ASTM D3453, Grade BD, Type 2.
- H. Vinyl Covering: ASTM D3690, Vinyl coated fabric, Class A.
- I. Plywood: PS1, Grade CD.

## **2.2 FASTENERS**

- A. Exposed Fasteners: Stainless steel or chromium plated brass, finish to match adjacent surface.
- B. Concealed Fasteners: Steel, hot-dip galvanized (except in high moisture areas such as showers or bath tubs use stainless steel).
- C. Toggle Bolts: For use in hollow masonry or frame construction.
- D. Hex bolts: For through bolting on thin panels.
- E. Screws:
  - 1. ASME B18.6.4.
  - 2. Fed Spec. FF-S-107, Stainless steel Type A.
- F. Adhesive: As recommended by manufacturer for products to be joined.

## **2.3 FINISH**

- A. In accordance with NAAMM AMP 500 series.
- B. Anodized Aluminum:
  - 1. AA-C22A41 Chemically etched medium matte, with clear anodic coating, Class I Architectural, 0.7-mil thick.
- C. Chromium Plating: ASTM B456, satin or bright as specified, Service Condition No. SC2.
- D. Stainless Steel: NAAMM AMP 503, finish number 4.
- E. Ferrous Metal:
  - a. Shop Prime: Clean, pretreat and apply one coat of primer and bake.
  - 1. Shop Prime: Clean, pretreat and apply one coat of primer and bake.
  - b. Finish: Over primer apply two coats of alkyd or phenolic resin enamel, and bake.
  - 2. Finish: Over primer apply two coats of alkyd or phenolic resin enamel, and bake.

## **2.4 FABRICATION - GENERAL**

- A. Welding, AWS D10.4.
- B. Grind, dress, and finish welded joints to match finish of adjacent surface.
- C. Form exposed surfaces from one sheet of stock, free of joints.

- D. Provide steel anchors and components required for secure installation.
- E. Form flat surfaces without distortion. Keep exposed surfaces free from scratches and dents. Reinforce doors to prevent warp or twist.
- F. Isolate aluminum from dissimilar metals and from contact with building materials as required to prevent electrolysis and corrosion.
- G. Hot-dip galvanized steel, except stainless steel, anchors and fastening devices.
- H. Shop-assemble accessories and package with all components, anchors, fittings, fasteners and keys.
- I. Key items alike.
- J. Provide templates and rough-in measurements as required.
- K. Round and deburr edges of sheets to remove sharp edges.

## **2.5 PAPER TOWEL DISPENSERS**

- A. Surface-mounted type with sloping top.
- B. Dispensing capacity for 300 sheets of any type of paper toweling.
- C. Fabricate of stainless steel.
- D. Provide door with continuous hinge at bottom, and either spring tension cam lock or tumbler lock, keyed alike, at top and a refill sight slot in front.

## **2.6 PAPER TOWEL DISPENSER WITH INTEGRATED TRASH CAN**

- A. Recessed and semi-recessed type.
- B. Dispensing capacity for 400 sheets of any type of paper toweling.
- C. Fabricate of stainless steel.
- D. Form face frames, from one piece.
- E. Provide each door with continuous stainless steel piano hinge and tumbler lock, keyed alike.
- F. Provide removable waste receptacle approximately 40 liter (10.5 gallon) capacity, fabricated of 0.45 mm (0.018-inch) thick stainless steel.

## **2.7 WASTE CONTAINERS**

- A. Semi-recessed type, without doors. Fed. Spec WW-P-541, Type II.
- B. Fabricate of stainless steel.
- C. Form face frame from one piece.
- D. Provide removable waste receptacle of approximately (12 gallon) capacity, fabricated of stainless steel.
- E. Waste receptacle key locked in place.

## **2.8 TOILET PAPER DISPENSERS**

- A. Double-roll surface-mounted type.
- B. Mount on continuous backplate.
- C. Removable spindle ABS plastic or chrome-plated plastic.
- D. Wood rollers are not acceptable.

## 2.9 GRAB BARS

- A. Fed. Spec WW-P-541/8B, Type IV, bars, surface mounted, Class 2, grab bars and ASTM F446.
- B. Fabricate of stainless steel, except use only one type throughout the Project:
  - 1. Stainless steel: Grab bars, flanges, mounting plates, supports, screws, bolts, and exposed nuts and washers.
- C. Concealed mount, except grab bars mounted at floor and swing-up grab bars.
- D. Bars:
  - 1. Fabricate from 38 mm (1-1/2 inch) outside diameter tubing.
    - a. Stainless steel, minimum 1.2 mm (0.0478 inch) thick.
  - 2. Fabricate in one continuous piece with ends turned toward walls, except swing up and where grab bars are shown continuous around three sides of showers, bars may be fabricated in two sections, with concealed slip joint between.
  - 3. Continuous weld intermediate support to the grab bar.
  - 4. Swing up bars manually operated. Designed to prevent bar from falling when in raised position.
- E. Flange for Concealed Mounting:
  - 1. Minimum of 2.65 mm (0.1046 inch) thick, approximately 75 mm (3 inch) diameter by 13 mm (1/2 inch) deep, with provisions for not less than three set screws for securing flange to back plate.
  - 2. Insert grab bar through center of the flange and continuously weld perimeter of grab bar flush to back side of flange.
- F. Flange for Exposed Mounting:
  - 1. Minimum 5 mm (3/16 inch) thick, approximately 75 mm (3 inch) diameter.
  - 2. Insert grab bar through flange and continuously weld perimeter of grab bar flush to backside of flange.
  - 3. Where mounted on floor, provide four equally spaced holes, sized to accommodate 5 mm (3/8 inch) diameter bolts, not more than 5 mm (3/8 inch) from edge of flange.
- G. In lieu of providing flange for concealed mounting, and back plate as specified, grab rail may be secured by being welded to a back plate and be covered with flange.
- H. Back Plates:
  - 1. Minimum 2.65 mm (0.1046 inch) thick metal.
  - 2. Fabricate in one piece, approximately 6 mm (1/4 inch) deep, with diameter sized to fit flange. Provide slotted holes to accommodate anchor bolts.

3. Furnish spreaders, through bolt fasteners, and cap nuts, where grab bars are mounted on // metal // // \_\_\_\_\_ // partitions.

#### **2.10 SHOWER CURTAIN RODS (NOT USED)**

#### **2.11 HOOKS (ROBE OR PURSE)**

- A. Fabricate hook units either of chromium-plated brass with a satin finish, or stainless steel, using 6 mm (1/4 inch) minimum thick stock, with edges and corners rounded smooth to the thickness of the metal, or 3 mm (1/8 inch) minimum radius.
- B. Fabricate each unit as a double hook on a single shaft, integral with or permanently fastened to the wall flange, provided with concealed fastenings.

#### **2.12 TOWEL BARS (NOT USED)**

#### **2.13 METAL-FRAMED MIRRORS**

- A. Fed. Spec. A-A-3002 metal frame; chromium-finished steel, anodized aluminum or stainless steel, Type 302 or 304.
- B. Mirror Glass:
  1. Minimum 6 mm (1/4 inch) thick.
  2. Set mirror in a protective vinyl glazing tape.
- C. Frames:
  1. Channel- or angle-shaped section with face of frame not less than 9 mm (3/8 inch) wide. Fabricate with square corners.
  2. Use either 0.9 mm (0.0359 inch) thick stainless steel, chrome-finished steel, or extruded aluminum with clear-anodized finish 0.4 mils thick.
- D. Back Plate:
  1. Fabricate backplate for concealed wall hanging of either zinc-coated, or cadmium-plated 0.9 mm (0.036 inch) thick sheet steel, die-cut to fit face of mirror frame, and furnish with theft-resistant concealed wall fastenings.
  2. Use set-screw-type theft-resistant concealed fastening system for mounting mirrors.
- E. Mounting Bracket:
  1. Designed to support mirror tight to wall.
  2. Designed to retain mirror with concealed set screw fastenings.

#### **2.14 MEDICINE CABINETS (NOT USED)**

#### **2.15 SOAP DISPENSER**

- A. Complete unit shall not be adversely affected by the liquid soap, aseptic detergent, or hexachlorophene solutions.
- B. Provide a removable gummed label, attached to container, stating that soap or detergent may be used in the dispensers.

2.16 SOAP DISHES (NOT USED)

2.17 PAPER CUP DISPENSER (NOT USED)

2.18 MOP RACKS (NOT USED)

2.19 STAINLESS STEEL SHELVES (TYPE 44) (NOT USED)

2.20 STAINLESS STEEL SHELVES, TYPES 45, AND/OR 45C (NOT USED)

2.21 STAINLESS STEEL SHELVES AT WHEELCHAIR LAVATORY (NOT USED)

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Before starting work notify COR in writing of any conflicts detrimental to installation or operation of units.
- B. Verify with the COR the exact location of accessories.

#### **3.2 INSTALLATION**

- A. Set work accurately, in alignment and where shown. Items shall be plumb, level, free of rack and twist, and set parallel or perpendicular as required to line and plane of surface.
- B. Toggle bolt to steel anchorage plates in frame partitions.
- C. Install accessories in accordance with the manufacturer's printed instructions and ASTM F446.
- D. Install accessories plumb and level and securely anchor to substrate.
- E. Install accessories in a manner that will permit the accessory to function as designed and allow for servicing as required without hampering or hindering the performance of other devices.
- F. Position and install dispensers, and other devices in countertops, clear of drawers, permitting ample clearance below countertop between devices, and ready access for maintenance as needed.
- G. Align mirrors, dispensers, and other accessories even and level, when installed in battery.
- H. Install accessories to prevent striking by other moving items or interference with accessibility.

#### **3.3 TOILET ACCESSORY SCHEDULE (SEE DRAWINGS)**

#### **3.4 CLEANING**

After installation, clean as recommended by the manufacturer and protect from damage until completion of the Project.

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**SECTION 10 44 13  
FIRE EXTINGUISHER CABINETS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section covers recessed fire extinguisher cabinets.

**1.2 RELATED WORK**

- A. Acrylic glazing: Section 08 80 00, GLAZING.
- B. Field Painting: Section 09 91 00, PAINTING.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data: Fire extinguisher cabinet including installation instruction and rough opening required.

**1.4 APPLICATION PUBLICATIONS**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society of Testing and Materials (ASTM):  
D4802-10.....Poly (Methyl Methacrylate) Acrylic Plastic  
Sheet

**PART 2 - PRODUCTS**

**2.1 FIRE EXTINGUISHER CABINET**

- A. Recessed type with flat trim of size and design shown.

**2.2 FABRICATION**

- A. Form body of cabinet from 0.9 mm (0.0359 inch) thick sheet steel.
- B. Fabricate door and trim from 1.2 mm (0.0478 inch) thick sheet steel with all face joints fully welded and ground smooth.
  - 1. Glaze doors with 6 mm (1/4 inch) thick ASTM D4802, clear acrylic sheet, Category B-1, Finish 1.
  - 2. Design doors to open 180 degrees.
  - 3. Provide continuous hinge, pull handle, and adjustable roller catch.

**2.3 FINISH**

- A. Finish interior of cabinet body with baked-on semi-gloss white enamel.
- B. Finish door, frame with manufacturer's standard baked-on prime coat suitable for field-painting.

**PART 3 - EXECUTION**

- A. Install fire extinguisher cabinets in prepared openings and secure in accordance with manufacturer's instructions.

B. Install cabinet so that bottom of cabinet is 914 mm (36 inches) above finished floor.

- - - E N D - - -

**SECTION 10 56 17**  
**WALL-MOUNTED STANDARDS AND SHELVING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Shelf standards, brackets, and accessories.
- B. Shelves.
- C. See drawings for locations.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 50 00 ("Metal Fabrications"), Section 06 10 00 ("Rough Carpentry"), and Section 09 22 16 ("Non-Structural Metal Framing"): Blocking in stud cavity.

**1.03 REFERENCE STANDARDS**

- A. NEMA LD 3 - High-Pressure Decorative Laminates.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store products under cover and elevated above grade.
- B. Store products in manufacturer's unopened packaging until ready for installation.

**PART 2 - PRODUCTS**

**2.01 MATERIALS**

- A. Heavy-Duty Shelf Standards: Double-slotted channel standards for brackets adjustable in 1-inch increments along entire length of standard, drilled and countersunk for screws.
  - 1. Load Capacity: Recommended by manufacturer for loading of 300 to 680 pounds per pair of standards.
  - 2. Material: Steel.
  - 3. Lengths: As required to provide shelves at 42, 57, and 72 inches above finished floor.
  - 4. Standard Quantity: Provide a minimum of two standards per location plus one standard for every 32 inches (or fraction thereof) over 36 inches.
  - 5. Finish: Electroplated, chrome-look.
  - 6. Brackets: Double-tab type, locking into slots; size to suit shelves; same finish as standards.
    - a. Size: 18
  - 7. Bracket Quantity: Provide three brackets per standard.
- B. Shelf Standard Accessories:
  - 1. Provide brackets with integral flanges; fasten with screws.
- C. Laminate-Faced Shelves: Particleboard or medium-density fiberboard covered with high-pressure decorative laminate on both sides.
  - 1. Edge Finish: Hot-melt PVC banding, same color.
  - 2. Substrate Thickness: 3/4 inch, nominal (spans up to 32 inches).
  - 3. Laminate: NEMA LD 3 Type HGL.

- 4. Laminate Color and Pattern: See Finish Legend on the Drawings.
- 5. Shelf Quantity: Provide three shelves per location.
- D. Fasteners: Screws as recommended by manufacturer for intended application or as otherwise required by project conditions.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Mount standards to solid backing capable of supporting intended loads.
- C. Install brackets, shelving, and accessories.

#### **3.04 PROTECTION**

- A. Protect installed products until completion of the Project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

- - - E N D - - -

**SECTION 11 52 13**  
**PROJECTION SCREENS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Front projection screen assemblies.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Wood blocking in ceilings.
- B. Section 09 90 00 - Painting and Coating: Field-painting.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog cuts and descriptive information on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Maintenance Data: Provide manufacturer's maintenance instructions.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: Experienced in installation of the work of this Section.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver projection screens to Project site in manufacturer's original unopened packaging. Inspect for damage and size before accepting delivery.
- B. Store in a protected, clean, dry area with temperature maintained above 50 degrees Fahrenheit. Stack according to manufacturer's recommendations.
- C. Acclimate screens to building temperatures for 24 hours prior to installation, or in accordance with manufacturer's recommendations.

**1.06 FIELD CONDITIONS**

- A. Maintain interior of building between 60 and 75 degrees Fahrenheit during and after installation of projection screens.

**PART 2 - PRODUCTS**

**2.01 FRONT PROJECTION SCREENS**

- A. Front Projection Screens: Factory-assembled unless otherwise indicated.
  - 1. In Conference Room: Motorized, matte light-diffusing fabric screen, horizontally tensioned without door that closes automatically, recessed in ceiling.
    - a. Nominal Screen Dimensions: 70-inches high by 70-inches wide.
- B. Matte Light-Diffusing Fabric: Light-diffusing screen fabric; washable, flame-retardant and mildew-resistant.
  - 1. Material: Matte white vinyl without backing, with nominal gain of 1.0 over viewing angle not less than 70 degrees from axis, horizontally and vertically.

- 2. Seams: No seams permitted in fabric up to 96 inch high by 72 inch wide.
- C. Masking Borders: Black, on four sides.
- D. Extra Drops: Black; 12 inches.
- E. Concealed-in-Ceiling Screen Cases: Steel; integral roller brackets.
  - 1. Door Slat: Self trim.
  - 2. Case Finish: Baked enamel.
  - 3. Case Color: White.
  - 4. End Caps: Steel; finished to match case.
- F. Provide mounting hardware, brackets, supports, fasteners, and other mounting accessories required for a complete installation, in accordance with manufacturer's recommendations for specified substrates and mountings.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that substrate is finished and ready to accept screen installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that openings for recessed screens are correctly sized.
- D. Do not install projection screens until climate control systems are in place and interior painting and other finishes are completed.

#### **3.02 PREPARATION**

- A. Coordinate screen installation with installation of projection systems.
- B. Coordinate installation with adjacent construction and fixtures, including ceilings, walls, lighting, fire-suppression, and registers and grilles.

#### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.
- B. Do not field-cut screens.
- C. Install screens in mountings as specified and as indicated on Drawings.
- D. Install plumb and level.
- E. Adjust projection screens and related hardware in accordance with manufacturer's instructions for proper placement and operation.

#### **3.04 PROTECTION**

- A. Protect installed products until completion of Project.
- B. Touch up, repair, or replace damaged products to Architect's satisfaction so that units are in an undamaged condition at Substantial Completion.

- - - END - - -

**SECTION 12 24 00  
WINDOW SHADES**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section includes cloth shades. Provide window shades complete, including brackets, fittings, and hardware.

**1.2 RELATED WORK (NOT USED)**

**1.3 QUALITY ASSURANCE:**

- A. Manufacturer's Qualification: Submit evidence that the manufacture has a minimum of three (3) years' experience in providing item of type specified, and that the blinds have performed satisfactorily on similar installations. Submit qualifications.
- B. Submit qualifications for installers who are trained and approved by manufacturer for installation of units provided.

**1.4 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
  - 1. Shade cloth, each type, 610 mm (24 inch) square, including cord and ring, showing color, finish, and texture.
- C. Manufacturer's literature and data; showing details of construction and hardware for:
  - 1. Cloth and window shades
- D. Shop Drawings: Provide fabrication and installation details for cloth shades, including shade cloth materials, their orientation to rollers, and their seam and batten locations.
- E. Fire Testing: Submit report of flame spread and smoke developed during product material tests by independent testing laboratory.
- F. Manufacturer's warranty.

**1.5 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their window shades for a minimum of five (5) years from date of installation and final acceptance by the Government. Submit manufacturer's warranty.

**1.6 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced to in the text by the basic designation only.
- B. ASTM International (ASTM):
  - A240/A240M-14.....Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
  - B221-14.....Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes
  - B221M-13.....Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes (Metric)
- C. National Fire Protection Association (NFPA):
  - 701-15.....Fire Tests for Flame Propagation of Textiles and Films

**PART 2 - PRODUCTS****2.1 CLOTH SHADES:**

- A. Light-Filtering Shade Cloth: Woven fabric, stain- and fade-resistant.
  - 1. Type: See Finishes on the Drawings.
  - 2. Weave: Mesh.
  - 3. Thickness: 0.0283 inch.
  - 4. Weight: 495 grams per square meter (14.6 ounces per square yard).
  - 5. Orientation on Shadeband: Up the bolt.
  - 6. Openness Factor: 3 percent.
  - 7. Fire-Test-Response Characteristics: Passes NFPA 701 small and large-scale vertical burn. Submit report for testing of shade cloth materials identical to products provided.
  - 8. Drive-End Location: As indicated on Construction Documents.

**2.2 VENETIAN BLINDS (NOT USED)****2.3 VERTICAL BLIND LOUVER BLADES (NOT USED)****2.4 VENETIAN BLINDS AND SHADES ENCLOSED IN WINDOWS FOR MENTAL HEALTH AND BEHAVIORAL CARE UNITS (NOT USED)****2.5 MATERIALS:**

- A. Stainless Steel: ASTM A240/A240M.
- B. Extruded Aluminum: ASTM B221M (B221).
- C. Cords for Cloth roller shades: #10 stainless steel chain having not less than 80 kg (175 pounds) breaking strength.



1. Provide clear plastic chain tensioner, compliant with WCMA safety standards.

## 2.6 FASTENINGS:

- A. Zinc-coated or cadmium-plated steel or stainless-steel fastenings of length and type recommended by manufacturer. Except as otherwise specified, provide fastenings for installation with various structural materials as follows:

Type of Fastening	Structural Material
Wood screw	Wood
Tap screw	Metal
Case-hardened, self-tapping screw in pre-drilled hole	Solid masonry, concrete
Screw or bolt in expansion shields	Solid masonry, concrete
Toggle bolts	Hollow blocks, gypsum wallboard, plaster

## 2.7 FABRICATION:

- A. Fabricate cloth shades to fit measurements of finished openings obtained at Project site.
- B. Cloth Shades: Rolling type, constructed of shade cloth mounted on rollers. Provide shade cloth with plain sides, and with hem at bottom to accommodate weight bar.
  1. Provide separate shades for each individual sash within opening. Provide shade length that exceeds height of window by 305 mm (12 inches) measured from head to sill, in addition to material required to make-up hem:
    - a. Provide rollers with spindles, nylon bearings, tempered steel springs, and other related accessories required for positive action.
      - 1) Provide heavy-duty die-cast metal clutch system in steel mounting bracket with auto stop feature for smooth, quiet, and easy lift capabilities.
      - 2) Provide universal spring-loaded end plug that mounts securely and provides for smooth and easy installation.
      - 3) Provide easy-lift counterbalance system with integrated spring support for ease of lifting roller shades over large expanses.

- 4) Engineer roller shade tubes to span large windows.
- 5) Provide integrated leveling device for easy adjustment after installation.
- b. Provide rollers of diameter and wall thicknesses required to accommodate operating mechanisms, weights, and widths of shadebands indicated without deflection.
- c. Provide rollers with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
- d. Secure shade cloth to rollers to prevent wrinkling or folding, and on line parallel to axis of rollers so that shade hangs plumb.
- e. Secure shade cloth with zinc-coated steel or stainless-steel machine screws spaced not over 228 mm (9 inches) on centers.
- f. Do not attach shade cloth to rollers with tacks.
- g. Provide hem bar of extruded aluminum for entire width of shade band. Heat-seal hem bar on all sides to prevent removal.
- h. Provide eyelets with clear openings large enough to accommodate cords, without cutting into cloth when set.
- i. Provide cords of sufficient length to permit shades to be drawn to bottom of opening with ends looped and held with cord rings. Attach cords to hems through metal eyelets in center of slats in bottom hems.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION:**

- A. Measure openings before fabrication. Do not scale construction documents.
- B. Cloth Shades: Mount window shades on end of face brackets, set on metal gussets, or casing of windows as required. Provide extension face brackets where necessary at mullions. In existing buildings, provide brackets similar to those on existing windows.
  - 1. Locate rollers in level position as high as practicable at heads of windows.
  - 2. Install shades to prevent infiltration of light over rollers.
  - 3. Where extension brackets are necessary for alignment of shades, provide metal lugs, and rigidly anchor lugs and brackets.
  - 4. Place brackets and rollers so that shades do not interfere with window and screen hardware.

5. Shade installation methods not specifically described, are subject to approval of Contracting Officer Representative (COR).

**3.2 ADJUSTING:**

- A. Adjust and shades to operate smoothly, free from binding or malfunction throughout entire operational range.

**3.3 CLEANING AND PROTECTION:**

- A. Clean shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions that ensure that shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged shades that cannot be repaired, in a manner approved by COR before time of Substantial Completion.

**3.4 DEMONSTRATION (NOT USED)**

- - - E N D - - -



**SECTION 12 32 00**  
**MANUFACTURED WOOD CASEWORK**

**PART 1 - GENERAL**

**1.1 DESCRIPTION:**

- A. This Section specifies plastic laminate casework as detailed on the construction documents, including related components and accessories required to form integral units. Wood casework items shown on the Construction Documents shall be included as part of the work under this Section, and applicable portions of the specification are to apply to these items.

**1.2 RELATED WORK:**

- A. Custom Wood Casework: Section 06 20 00, FINISH CARPENTRY.  
B. Sealants: Section 07 92 00, JOINT SEALANTS.  
C. Resilient Base: Section 09 65 13, RESILIENT BASE AND ACCESSORIES.  
D. Backing Plates for Wall Mounted Casework: Section 09 22 16, NON-STRUCTURAL METAL FRAMING.  
E. Countertop Construction and Materials and Items Installed in Countertops: Section 12 36 00, COUNTERTOPS.  
F. Plumbing Requirements Related to Casework: Division 22, PLUMBING.  
G. Electrical Lighting and Power Requirements Related to Casework: Division 26, ELECTRICAL.

**1.3 SUBMITTALS:**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.  
B. Manufacturer's Literature and Data:  
1. Locks for doors and drawers.  
2. Adhesive cements.  
3. Casework hardware.  
C. Shop Drawings (half full size):  
1. Each casework type, showing details of construction, including materials, hardware, and accessories.  
2. Fastenings and method of installation.  
D. Certification:  
1. Manufacturer's qualifications specified.  
2. Installer's qualifications specified.

**1.4 QUALITY ASSURANCE:**

- A. Approval by COR is required of manufacturer and installer based upon certification of qualifications specified.

B. Manufacturer's qualifications:

1. Manufacturer is regularly engaged in design and manufacture of modular plastic laminate casework, casework components, and accessories of scope and type similar to indicated requirements for a period of not less than five (5) years.
2. Manufacturer has successfully completed at least three (3) projects of scope and type similar to indicated requirements.
3. Submit manufacturer's qualifications and list of projects, including owner contact information.

C. Installer Qualifications:

1. Installer has completed at least three (3) projects in last five (5) years in which these products were installed.
2. Submit installer qualifications.

**1.5 WARRANTY:**

- A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their wood casework for a minimum of five (5) years from date of installation and final acceptance by the Government. Submit manufacturer warranty.

**1.6 APPLICABLE PUBLICATIONS:**

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.
- B. ASTM International (ASTM):
  - A240/A240M-14.....Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
  - A1008/A1008M-13.....Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
- C. Builders Hardware Manufacturers Association (BHMA):
  - A156.1-13.....Butts and Hinges
  - A156.9-10.....Cabinet Hardware
  - A156.5-14.....Auxiliary Locks and Associated Products
  - A156.11-14.....Cabinet Locks
- D. Composite Panel Association (CPA):
  - A208.1-09.....Particleboard

A208.2-09.....Medium Density Fiberboard (MDF) for Interior  
Applications

- E. U.S. Department of Commerce Product Standards (Prod. Std):  
PS 1-09.....Construction and Industrial Plywood
- F. Architectural Woodwork Institute (AWI) / Architectural Woodwork  
Manufacturers Association of Canada (AWMAC) / Woodwork Institute (WI):  
AWS-14                      Architectural Woodwork Standards, Edition 2
- G. Architectural Woodwork Institute (AWI):  
AWI Quality Certification Program
- H. National Electrical Manufacturers Association (NEMA):  
LD 3-05.....High Pressure Decorative Laminates
- I. Underwriters Laboratories Inc. (UL):  
437-08(R2013).....Key Locks

**PART 2 - PRODUCTS**

**2.1 PLYWOOD, HARDWOOD FACE VENEER (NOT USED)**

**2.2 PLASTIC LAMINATE:**

- A. NEMA LD 3.
- B. Exposed decorative surfaces, both sides of cabinet doors, and for items having plastic laminate finish. General purpose Type HGL.
- C. Cabinet Interiors Including Shelving: Both of following options to comply with NEMA CLS as a minimum.
  - 1. Plastic-laminate clad plywood or particleboard, MDF (excluding shelves).
- D. Backing sheet on bottom of plastic laminate covered wood tops. Backer Type BKL.
- E. Post-Forming Fabrication, Decorative Surface: Post-forming Type HGP.

**2.3 PLYWOOD, SOFTWOOD:**

- A. Prod. Std. PS1, five (5) ply construction from 13 mm to 28 mm (1/2 inch to 1-1/8 inch) thickness, and seven (7) ply for 31 mm (1 1/4 inch) thickness.

**2.4 PARTICLEBOARD:**

- A. CPA A208.1, Type 1, Grade M or medium density.

**2.5 MEDIUM DENSITY FIBERBOARD (MDF):**

- A. Fully waterproof bond conforming to CPA A208.1 and CPA A208.2.

**2.6 GLASS:**

- A. ASTM C1048 Kind FT Type I, Class 1, Quality q3.
- B. For Doors: 6 mm (1/4 inch) thick; except where laminated glass is shown on Construction Documents.

- C. Laminated Glass: Fabricate of two (2) sheets of 3 mm (1/8 inch) thick clear ASTM C1172 Kind LT glass, laminated together with a 1.5 mm (0.060 inch) thick vinyl interlayer, to a total overall thickness of 8 mm (5/16 inch).

## **2.7 HARDWARE:**

### **A. Cabinet Locks:**

1. Provide where locks are indicated on Construction Documents.
2. Locked pair of hinged door over 915 mm (36 inches) high:
  - a. ANSI/BHMA A156.5, key one side.
  - b. On active leaf use three-point locking device, consisting of two (2) steel rods and lever-controlled cam at lock, to operate by lever having lock cylinder housed therein.
  - c. On inactive leaf provide dummy lever of same design.
  - d. Provide keeper holes for locking device rods and cam.
3. Door and Drawer: ANSI/BHMA A156.11 cam locks. Provide one (1) type for each condition as follows:
  - a. Drawer and Hinged Door up to 915 mm (36 inches) high: E07261.
  - b. Drawer and Hinged Door: Pin-tumbler, cylinder type lock with not less than four (4) pins or a UL 437 rated wafer lock with brass working parts and case.
  - c. Sliding Door: E07161.
4. Key locks differently for each type casework and master key for each service.
  - a. Key drug locker inner door different from outer door.
  - b. Furnish two (2) keys per lock.
  - c. Furnish six (6) master keys per service.
5. Marking of Locks and Keys:
  - a. Name of manufacturer, or trademark which shall readily be identified, legibly marked on each lock, and key change number marked on exposed face of lock.
  - b. Key change numbers stamped on keys.
  - c. Key change numbers to provide sufficient information for manufacturer to replace key.

### **B. Hinged Doors:**

1. Provide doors 915 mm (36 inches) and more in height with three (3) hinges and doors less than 915 mm (36 inches) in height shall have two (2) hinges. Each door shall close against two (2) rubber bumpers.



2. Concealed Hinges: BHMA A156.9, Type B01602, 100 degrees of opening, self-closing.
  3. Fasteners: Provide full-thread wood screws to fasten hinge leaves to door and cabinet frame. Finish screws to match finish of hinges.
- C. Door Catches:
1. Friction or Magnetic type, fabricated with metal housing.
  2. Provide one (1) catch for cabinet doors 1220 mm (48 inches) high and under, and two (2) for doors over 1220 mm (48 inches) high.
- D. Drawer and Door Pulls:
1. Doors and drawers to have flush pulls, fabricated of either chromium-plated brass, chromium-plated steel, stainless steel, or anodized aluminum. Drawer and door pulls to be of a design that can be operated with a force of 22.2 N (5 pounds) or less, with one (1) hand and not require tight grasping, pinching, or twisting of the wrist.
- E. Drawer Slides:
1. Full-extension steel slides with nylon ball-bearing rollers.
  2. Slides to have positive stop.
  3. Equip drawers with rubber bumpers.
4. Waste and Recycling Bins:
- a. Heavy-duty, under-mounted slide with soft-close technology.
  - b. Self-aligning brackets secured with four screws.
  - c. Side rails for stability and to conceal slide hardware.
  - d. Easy-to-clean solid backsplash and floor to prevent debris from falling through to floor/cabinet.
  - e. Bins.
  - f. Brackets for Mounting Overlay Door:
    - 1) Concealed two-screw leveling.
    - 2) Slotted screw holes for centering.
- F. Shelf Standards (Except for Fixed Shelves):
1. Bright zinc-plated steel for recessed mounting with screws, 16 mm (5/8 inch) wide by 5 mm (3/16 inch) high providing 13 mm (1/2 inch) adjustment, complete with shelf supports.
- G. Articulating Keyboard Assembly.
1. Keyboard Support Mechanism: Easily used by physically challenged users. Having an extended, fully adjustable spring-assisted arm with a locking/release mechanism. A closed fist shall be able to lock and

- unlock a single large, horizontal lever on the front of the unit for setting height and tilt position to adjust keyboard.
  - a. Keyboard Height Adjustment: Total range of 8 inches.
  - b. Tilt Range: Plus-or-minus 15 degrees.
  - c. Rear Swivel: 360 degrees.
  - d. Fully retractable.
  - e. 21-inch minimum track.
  - f. Steel construction finished in a durable black textured powder coat.
2. Keyboard Tray: Platform shall be predrilled to mount securely to keyboard supports. Platform shall be wood construction with a durable, stain-resistant black vinyl covering, providing a non-skid work surface.
  3. Wrist Support: Black polyurethane foam or polyurethane gel versions, minimum 19-inches wide, and capable of being mounted to the keyboard tray.
  4. Mouse Support: Mouse surface shall be a rigid, non-handed design which fastens to keyboard tray.
    - a. 8-inches square pad with an integral friction surface for smooth mouse operation.
    - b. Stored underneath the keyboard platform when not in use.
    - c. Having a 360-degree swivel with some ability to adjust tilt angle.
    - d. Steel construction finished in a durable black textured powder coat.

## **2.8 MANUFACTURED PRODUCTS:**

- A. When two (2) or more units are required, use products of one (1) manufacturer.
- B. Manufacturer of casework assemblies is to assume complete responsibility for the final assembled unit.
- C. Provide products of a single manufacturer for parts which are alike.

## **2.9 FABRICATION:**

- A. Casework to be of the flush overlay design and, except as otherwise specified, be of Premium Grade construction and of component thickness in conformance with the AWS.
- B. Fabricate casework of plastic-laminated-covered plywood or particleboard as follows:

1. Where shown, doors, drawers, shelves, and all semi-concealed surfaces shall be plastic laminated.

C. Support Members for Tops of Tables and Countertops:

1. Construct as detailed on Construction Documents.
2. Provide miscellaneous steel members and anchor as shown on Construction Drawings.

**2.10 PRODUCTS OF OTHER COMPONENTS DIRECTLY RELATED TO CASEWORK:**

- A. Refer to Section 07 92 00, JOINT SEALANTS for work related to sealants used in conjunction with joints of countertops, casework systems, and adjacent materials.
- B. Refer to Section 09 65 13, RESILIENT BASE AND ACCESSORIES for work related to rubber base adhered to casework systems.
- C. Refer to Section 09 22 16, NON-STRUCTURAL METAL FRAMING for backing plates used in conjunction with wall assemblies for the attachment of casework systems.
- D. Refer to Section 12 36 11, COUNTERTOPS for work related to methyl methacrylic polymer countertops used in conjunction with casework systems. When countertop materials are provided by the casework manufacturer, they are to include the following features:
  1. Capable of being suspended from vertical support rails or horizontal wall strips or service modules.
  2. Provided with rounded corners and impact-resistant material on exposed edges.
  3. Capable of being easily relocated and installed without tools.
  4. Capable of being suspended and easily changed under counter-mounted storage units.
  5. Provide leveling adjustment capability so units can be brought into a level position.
  6. Secured using fasteners. Show detail on Shop Drawings.
- E. Refer to Division 22, PLUMBING for the following work related to casework systems:
  1. Sinks, faucets, and other plumbing service fixtures, venting, and piping systems.
  2. Compressed air, gas, vacuum, and piping systems.
- F. Refer to Division 26, ELECTRICAL for the following work related to casework systems:
  1. Connections and wiring devices.

2. Connections and lighting fixtures except when factory-installed by the manufacturer.

### **PART 3 - EXECUTION**

#### **3.1 COORDINATION:**

- A. Begin only after work of other trades is complete, including wall and floor finish completed, ceilings installed, light fixtures and diffusers installed and connected and area free of trash and debris.
- B. Verify location and size of mechanical and electrical services as required and perform cutting of components of work installed by other trades.
- C. Verify reinforcement of walls and partitions for support and anchorage of casework.
- D. Coordinate with other Divisions and Sections of the specification for work related to installation of casework systems to avoid interference and completion of service connections.

#### **3.2 INSTALLATION:**

- A. Install casework in accordance with manufacturer's written instructions.
  1. Install in available space; arranged for safe and convenient operation and maintenance.
  2. Align cabinets for flush joints except where shown otherwise.
  3. Install with bottom of wall cabinets in alignment and tops of base cabinets aligned level, plumb, true, and straight to a tolerance of 3.2 mm in 2438 mm (1/8 inch in 96 inches).
  4. Install corner cabinets with hinges on corner side with filler or spacers sufficient to allow opening of drawers.
- B. Support Rails:
  1. Install true to horizontal at heights shown on Construction Documents; maximum tolerance for uneven floors is plus-or-minus 13 mm (1/2 inch).
  2. Shim as necessary to accommodate variations in wall surface not exceeding 5 mm (3/16 inch) at fastener.
- C. Wall Strips:
  1. Install true to vertical and spaced as shown on construction documents.
  2. Align slots to assure that hanging units will be level.
- D. Seal junctures of casework systems with mildew-resistant silicone sealants as specified in Section 07 92 00, JOINT SEALANTS.

**3.3. CLOSURES AND FILLER PLATES:**

- A. Close openings larger than 6 mm (1/4 inch) wide between cabinets and adjacent walls with flat, steel closure strips, scribed to required contours, or machine-formed steel fillers with returns, and secured with sheet-metal screws to tubular or channel members of units, or bolts where exposed on inside.
- B. Secure filler plates to casework top members, unless shown otherwise on Construction Documents.
- C. Secure filler plates more than 152 mm (6 inches) in width top edge to a continuous 25 x 25 mm (1 x 1 inch) 0.889 mm (1/16 inch) thick formed-steel angle with screws.
- D. Anchor angle to ceiling with toggle bolts.
- E. Install closure strips at exposed ends of pipe space and offset opening into concealed space.
- F. Finish closure strips and fillers with same finishes as cabinets.

**3.4 FASTENINGS AND ANCHORAGE:**

- A. Do not anchor to wood ground strips.
- B. Provide hat-shaped metal spacers where fasteners span gaps or spaces.
- C. Use 6 mm (1/4 inch) diameter toggle or expansion bolts, or other appropriate size and type fastening device for securing casework to walls or floor. Use expansion bolts shields having holding power beyond tensile and shear strength of bolt and breaking strength of bolt head.
- D. Use 6 mm (1/4 inch) diameter hex bolts for securing cabinets together.
- E. Use 6 mm (1/4 inch) by minimum 38 mm (1-1/2 inch) length lag bolt anchorage to wood blocking for concealed fasteners.
- F. Use not less than No. 12 or 14 wood screws with not less than 38 mm (1-1/2 inch) penetration into wood blocking.
- G. Space fastening devices 305 mm (12 inches) on center with minimum of three (3) fasteners in 915 or 1220 mm (3 or 4 foot) unit width.
- H. Anchor floor-mounted cabinets with a minimum of four (4) bolts through corner gussets. Anchor bolts may be combined with or separate from leveling device.
- I. Secure cabinets in alignment with hex bolts or other internal fastener devices removable from interior of cabinets without special tools. Do not use fastener devices which require removal of tops for access.
- J. Where units abut end-to-end, anchor together at top and bottom of sides at front and back. Where units are back-to-back, anchor backs together at corners with hex bolts placed inconspicuously inside casework.

- K. Where type, size, or spacing of fastenings is not shown on Construction Documents or specified, show on Shop Drawings proposed fastenings and method of installation.

**3.5 ADJUSTMENTS:**

- A. Adjust equipment to ensure proper alignment and operation.
- B. Replace or repair damaged or improperly operating materials, components or equipment.

**3.6 CLEANING:**

- A. Immediately following installation, clean each item, removing finger marks, soil, and foreign matter.
- B. Remove from Project site trash, debris, and packing materials.
- C. Leave installed areas clean of dust and debris.

**3.7 INSTRUCTIONS:**

- A. Provide operational and cleaning manuals and verbal instructions in accordance with Article INSTRUCTIONS, SECTION 01 00 00, GENERAL REQUIREMENTS.
- B. Provide in-service training both prior to and after facility opening. Coordinate in service activities with COR.
- C. Commencing at least seven (7) days prior to opening of facility, provide one (1) four (4) hour day of on-site orientation and technical instruction on use and cleaning procedures applicable to products and systems specified herein.

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**SECTION 12 36 00  
COUNTERTOPS**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This Section specifies casework countertops with integral accessories.

**1.2 RELATED WORK**

- A. Vertical solid surfacing along wet walls: SECTION 06 61 16, SOLID SURFACING FABRICATIONS.
- B. Stainless-steel sink: DIVISION 22, PLUMBING.
1. To avoid creating an infection-control risk, set stainless-steel sinks into countertop from above. Stainless-steel sinks undermounted to countertops will not be acceptable.
- C. DIVISION 26, ELECTRICAL.

**1.3 SUBMITTALS**

- A. Submit in accordance with SECTION 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings
1. Show dimensions of section and method of assembly.
2. Show details of construction at 1/2-inch-equals-1-foot scale.
- C. Samples:
1. 150 mm (6 inch) square samples each top.
2. Front edge, back splash, end splash, and core with surface material and booking.

**1.4 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
- D256-10.....Pendulum Impact Resistance of Plastic
- D570-98(R2005).....Water Absorption of Plastics
- D638-10.....Tensile Properties of Plastics
- D785-08.....Rockwell Hardness of Plastics and Electrical Insulating Materials
- C. National Electrical Manufacturers Association (NEMA):
- LD 3-05.....High Pressure Decorative Laminates

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. Solid Polymer Material:
1. Filled Methyl Methacrylic Polymer.

## 2. Performance properties required:

Property	Result	Test
Elongation	0.3% min.	ASTM D638
Hardness	90 Rockwell M	ASTM D785
Gloss (60° Gordon)	5-20	NEMA LD3.1
Color stability	No change	NEMA LD3 except 200 hour
Abrasion resistance	No loss of pattern Max wear depth 0.0762 mm (0.003 in) - 10000 cycles	NEMA LD3
Water absorption weight (5 max)	24 hours 0.9	ASTM D-570
Izod impact	14 N·m/m (0.25 ft-lb/in)	ASTM D256 (Method A)
Impact resistance	No fracture	NEMA LD-3 900 mm (36") drop 1 kg (2 lb.) ball
Boiling water surface resistance	No visible change	NEMA LD3
High temperature resistance	Slight surface dulling	NEMA LD3

3. Cast into sheet form.
4. Color throughout with subtle veining through thickness.
5. Joint adhesive and sealer: Manufacturers silicone adhesive and sealant for joining methyl methacrylic polymer sheet.
6. Bio-based products will be preferred.

**2.2 SINKS (SEE DIVISION 22 ("PLUMBING"))****2.3 TRAPS AND FITTINGS**

A. Material as specified in DIVISION 22, PLUMBING.

**2.4 WATER FAUCETS (SEE DIVISION 22 ("PLUMBING"))****2.5 FUEL GAS, LABORATORY AIR AND LABORATORY VACUUM FIXTURES (NOT USED)****2.6 FIXTURE IDENTIFICATION (NOT USED)****2.7 ELECTRICAL RECEPTACLES (NOT USED)****2.8 ELECTRIC DROP-IN HOTPLATE (RANGE) UNITS (NOT USED)****2.9 FILM VIEWER (NOT USED)****2.10 COUNTERTOPS**

- A. Fabricate in largest sections practicable.
- B. Fabricate with joints flush on top surface.
- C. Fabricate countertops to overhang front of cabinets and end of assemblies 25 mm (one inch) except where against walls or cabinets.



Fabricate countertops with integral (coved) backsplashes where back edges of countertops are against wall.

- D. Provide 1 mm (0.039 inch) thick metal plate connectors or fastening devices.
- E. Join edges in a chemical-resistant waterproof cement or epoxy cement.
- F. Fabricate countertops with applied end splashes where side edges of countertops are against walls or cabinets.
- G. Splash Backs and End Splashes:
  - 1. Not less than 19 mm (3/4 inch) thick.
  - 2. Height 100 mm (4 inches) unless noted otherwise.
- H. Drill or cutout for sinks, and penetrations.
  - 1. Accurately cut for size of penetration.
  - 2. Configure cutout for sink per sink manufacturer's guidelines to ensure ADA-compliance.
- I. Methyl Methacrylic Polymer Tops:
  - 1. Fabricate countertop of methyl methacrylic polymer cast sheet, 19 mm (3/4 inch) thick.
  - 2. Fabricate back splash and end splash to height shown.
  - 3. Fabricate in one piece for full length from corner to corner up to 3600 mm (12 feet).
  - 4. Join pieces with adhesive sealant.
  - 5. Cut out countertop for lavatories, plumbing trim.
  - 6. Provide concealed fasteners and epoxy cement for anchorage of sinks to countertop.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Before installing countertops verify that wall surfaces have been finished as specified and that mechanical and electrical service locations are as required.
- B. Secure countertops to supporting rails of cabinets with metal fastening devices, or screws through pierced slots in rails.
  - 1. Where type, size, or spacing of fastenings is not shown or specified, submit Shop Drawings showing proposed fastenings and method of installation.
  - 2. Use round-head bolts or screws.
- C. Faucets, Fixtures, and Outlets:
  - 1. Seal opening between fixture and top.
  - 2. Secure to top with manufacturers standard fittings.

#### **3.2 PROTECTION AND CLEANING**

- A. Tightly cover and protect against dirt, water, and chemical or mechanical injury.

B. Clean at completion of work.

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