DEPARTMENT OF VETERANS AFFAIRS
AUDIOLOGY RENOVATIONS
At Michael E. DeBakey VA Medical Center

Houston, Texas

Project Number 580-18-101

PROJECT MANUAL

Construction Documents

JULY 25, 2018

Department of Veterans Affairs Audiology Renovations

At Michael E. DeBakey VA Medical Center, Houston, Texas
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1.1 GENERAL INTENTION

A. Contractor shall completely prepare site for building operations, including demolition and removal of existing structures, and furnish labor and materials and perform work for Department of Veterans Affairs, Renovate Medical Media for Geriatrics/ Wound Care Clinic, Michael E. DeBakey VA Medical Center, Houston, Texas, as required by Drawings and Specifications.

B. Visits to the site by Bidders may be made only by appointment with the Contracting Officer’s Representative (COR).

C. Before placement and installation of work subject to tests by testing laboratory retained by Department of Veterans Affairs, the Contractor shall notify the COR in sufficient time to enable testing laboratory personnel to be present at the site in time for proper taking and testing of specimens and field inspection. Such prior notice shall be not less than 3 work days unless otherwise designated by the COR.

D. 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.

E. 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.

F. 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.

G. VHA Directive 2011-36, Safety and Health during Construction, dated 9/22/2011 in its entirety is made a part of this Section. Contractor shall submit valid negative tuberculin screening test documentation, for each worker, dated within 90 days prior to assignment to the work site.

1.2 STATEMENT OF BID ITEM(S)

A. RENOVATION: Work includes general construction, alterations, mechanical and electrical work, utility systems, necessary removal of existing structures and construction and certain other items.

B. Refer to Solicitation, Offer and Award, VA Document Standard Form 1442, for description of Work, basis of award, Base Bid, and Bid Options.

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. AFTER AWARD OF CONTRACT, the Contractor will be furnished electronic files of the Contract Documents for Contractor’s use in executing the Contract.

B. Additional sets of Drawings may be made by the Contractor, as needed or required, at Contractor's expense.

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 subcontractors 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 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 COR.

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 COR.

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the 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.

D. Document Control:

1. Before starting any work, the General Contractor/subcontractors 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 COR upon request.

4. These security documents shall not be removed or transmitted from the Project site without the written approval of COR.

5. All paper waste or electronic media such as CDs and diskettes shall be shredded and destroyed in a manner acceptable to the VA.

6. Notify COR 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.

E. Motor Vehicle Restrictions:

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access shall be restricted to picking up and dropping off materials and supplies.

2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

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 COR 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 COR 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 20 feet exposing overall length, separate by 10 feet.

E. Temporary Construction Partitions:

1. Install and maintain temporary construction partitions to provide 1 hour separations between construction areas 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. 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 COR.

H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to COR.

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. Standpipes: Install and extend standpipes up as required and indicated on the Drawings, in accordance with 29 CFR 1926 and NFPA 241.

L. Sprinklers: Install, test and activate new automatic sprinklers prior to removing existing sprinklers.

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 COR. 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 COR.

N. Smoke Detectors: Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with COR.

O. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COR. Obtain permits from facility Safety Officer 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 COR.

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 COR 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 COR. 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 COR 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 COR, the buildings and utilities may be abandoned and need not be removed.

C. The Contractor shall, under regulations prescribed by the COR, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the COR. 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 COR.

E. Working space and space available for storing materials shall be as shown on the Drawings.

F. Workmen are subject to rules of Michael E. DeBakey Medical Center applicable to their conduct.

G. Execute work so as to interfere as little as possible with normal functioning of Michael E. DeBakey 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 COR where required by limited working space.

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

2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than 2 work days. Provide unobstructed access to Michael E. DeBakey Medical Center areas required to remain in operation.

3. Where access by Michael E. DeBakey Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.

H. 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 COR. All such actions shall be coordinated with the Utility Company involved.

I. Phasing: To insure such executions, Contractor shall furnish the COR with a schedule of approximate dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof. In addition, Contractor shall notify the COR 2 weeks in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such dates to insure accomplishment of this work in successive phases mutually agreeable to COR and Contractor.

J. Building No. B100 will be occupied during performance of work; but immediate areas of alterations will be vacated.

1. 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 Center’s 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.

2. Immediate areas of alterations not mentioned in preceding subparagraph 1 will be temporarily vacated while alterations are performed.

K. When a Project area is turned over to Contractor, Contractor shall accept entire responsibility therefore.

1. Contractor shall maintain a minimum temperature of 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 Department of Veterans Affairs, whichever will be required to respond to an alarm from Contractor's employee or watchman.

L. Utilities Services: Maintain existing utility services for Michael E. DeBakey 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 COR.

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 COR. 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 COR, 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 Michael E. DeBakey 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 COR.

5. In case of a contract construction emergency, service will be interrupted on approval of COR. Such approval will be confirmed in writing as soon as practical.

M. 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 but are not required to be entirely removed, shall be sealed, capped or plugged. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces.

N. 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. Wherever excavation for new utility lines cross existing roads, at least 1 lane must be open to traffic at all times.

2. Method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the COR.

O. Coordinate the Work for this Contract with other construction operations as directed by COR. This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

1.7 ALTERATIONS

A. Survey: Before any work is started, the Contractor shall make a thorough survey with the COR and a representative of VA Supply Service, of areas of buildings in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by all three, to the COR. 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.

2. Existence and conditions of items such as plumbing fixtures and accessories, electrical fixtures, equipment, venetian blinds, shades, etc., required by Drawings to be either reused or relocated, or both.

3. Shall note any discrepancies between Drawings and existing conditions at site.

4. Shall designate 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 COR.

B. Any items required by Drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of COR and/or Supply Representative, to be in such condition that their use is impossible or impractical, shall be furnished by the VA or replaced by Contractor with new items in accordance with Specifications which will be furnished by Government. Provided the Contract work is changed by reason of this subparagraph B, the Contract will be modified accordingly, under provisions of clauses entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).

C. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and COR 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 VAMC’s Infection Control Risk Assessment (ICRA) team. ICRA Group 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 Group as specified here. Prior to start of work, prepare a plan detailing Project-specific dust protection measures, including periodic status reports, and submit to COR and Facility ICRA team 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 COR. 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 COR. 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, 1-hour fire-rated temporary drywall construction 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. Install a self-closing rated door in a metal frame, commensurate with the partition, to allow worker access. 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 COR and Medical Center.

b. High Efficiency Particulate Accumulator (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 filter vacuum system rated at 95 percent 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 24 by 36 inches, 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 COR 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 freestanding), 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 reinstallation and reuse. Store such items where directed by COR.

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 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site which are not to be removed and which do not unreasonably interfere with the work required under this Contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during Contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the COR.

B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this Contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the COR may have the necessary work performed and charge the cost to the Contractor.

1.11 RESTORATION

A. 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 COR. Existing work to be altered or extended and that is found to be defective in any way shall be reported to the COR 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 clauses entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.12 PHYSICAL DATA

A. Data and information furnished or referred to below is for the Contractor's information. The Government shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.

1. The indications of physical conditions on the Drawings and in the specifications are the result of site investigations.

1.13 LAYOUT OF WORK

A. The Contractor shall lay out the interior renovation work 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. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the COR. The Contractor shall also be responsible for maintaining and preserving all stakes and other marks established by the COR until authorized to remove them. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the COR may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

1.14 AS-BUILT DRAWINGS

A. The Contractor shall maintain 2 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 COR's review as often as requested.

C. Contractor shall deliver 2 approved completed sets of As-built Drawings to the COR within 15 calendar days after each completed phase and after the acceptance of the Project by the COR.

D. Paragraphs A, B, and C shall also apply to all shop drawings.

1.15 USE OF ROADWAYS

A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the COR, 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.

1.16 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 COR. If the equipment is not installed and maintained in accordance with the following provisions, the COR will withdraw permission for use of the equipment.

a. 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.

b. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.

c. Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze-up damage.

d. 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.

e. All components of heat production and distribution system, metering equipment, condensate returns, and other auxiliary facilities used in temporary service shall be cleaned prior to use; maintained to prevent corrosion internally and externally during use; and cleaned, maintained, and inspected prior to acceptance by the Government.

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.

1.17 TEMPORARY TOILETS

A. Contractor may have for use of Contractor's workmen, such toilet accommodations as may be assigned to Contractor by Medical Center. Contractor shall keep such places clean and be responsible for any damage done thereto by Contractor's workmen. Failure to maintain satisfactory condition in toilets will deprive Contractor of the privilege to use such toilets.

1.18 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 COR, 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 Cemetery 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.

   a. Steam is available at no cost to Contractor.

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 COR'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 COR's discretion), of use of steam from the Medical Center's system.

1.19 NEW TELEPHONE EQUIPMENT

A. 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.

1.20 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 COR. 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.

1.21 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 1 compact disc (4 hard copies and 1 electronic copy each) for each separate piece of equipment shall be delivered to the COR coincidental with the delivery of the equipment to the jobsite. 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 jobsite. 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 interrelated systems. All instruction periods shall be at such times as scheduled by the COR and shall be considered concluded only when the COR 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 COR, does not demonstrate sufficient qualifications in accordance with requirements for instructors above.

1.22 GOVERNMENT-FURNISHED PROPERTY

A. The Government shall deliver to the Contractor the Government-furnished property shown on the Drawings.

B. Equipment furnished by Government to be installed by Contractor will be furnished to Contractor at the Medical Center.

C. Storage space for equipment will be provided by the Government and the Contractor shall be prepared to unload and store such equipment therein upon its receipt at the Medical Center.

D. Notify COR in writing, 60 days in advance, of date on which Contractor will be prepared to receive equipment furnished by Government. Arrangements will then be made by the Government for delivery of equipment.

1. Immediately upon delivery of equipment, Contractor shall arrange for a joint inspection thereof with a representative of the Government. At such time the Contractor shall acknowledge receipt of equipment described, make notations, and immediately furnish the Government representative with a written statement as to its condition or shortages.

2. Contractor thereafter is responsible for such equipment until such time as acceptance of Contract Work is made by the Government.

E. Equipment furnished by the Government will be delivered in a partially assembled (knock down) condition in accordance with existing standard commercial practices, complete with all fittings, fastenings, and appliances necessary for connections to respective services installed under contract. All fittings and appliances (i.e., couplings, ells, tees, nipples, piping, conduits, cables, and the like) necessary to make the connection between the Government furnished equipment item and the utility stub-up shall be furnished and installed by the Contractor at no additional cost to the Government.

F. Completely assemble and install the Government furnished equipment in place ready for proper operation in accordance with Specifications and Drawings.

G. Furnish supervision of installation of equipment at construction site by qualified factory trained technicians regularly employed by the equipment manufacturer.

1.23 RELOCATED EQUIPMENT AND ITEMS

A. Contractor shall disconnect, dismantle as necessary, remove and reinstall in new location, all existing equipment and items indicated by symbol "R" or otherwise shown 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 COR.

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.

E. Contractor shall employ services of an installation engineer, who is an authorized representative of the manufacturer of this equipment to supervise assembly and installation of existing eye care equipment required to be relocated.

F. All service lines such as noted above for relocated equipment shall be in place at point of relocation ready for use before any existing equipment is disconnected. Make relocated existing equipment ready for operation or use immediately after reinstallation.

1.24 HISTORIC PRESERVATION

A. Where the Contractor or any of the Contractor's employees, prior to, or during the construction work, are advised of or discover any possible archeological, historical and/or cultural resources, the Contractor shall immediately notify the COR verbally, and then with a written follow up.

1.25 VA TRIRIGA CPMS

A. VA contractors, selected by award to perform work, are required to get access to the VA TRIRIGA CPMS. The TRIRIGA CPMS is the management and collaborative environment that the VA uses for all Major, Minor and Non-Recurring Maintenance (NRM) projects within the Office of Construction & Facilities Management (CFM), Veterans Health Administration (VHA), National Cemetery Administration (NCA), and the Veterans Benefits Administration (VBA).

1. The Contractor is solely responsible for acquiring access to the VA TRIRIGA CPMS.

2. To gain access to the VA TRIRIGA CPMS the Contractor is encouraged to follow the licensing process outline as specified below.

B. Requirement: TRIRIGA is the management and collaborative environment that VA uses for all construction projects. VA requires its contractors to procure TRIRIGA access as part of the cost of performance for a VA construction related contract.

C. Access Request and Payment can be made through the following URL

https://valicensing.oncfi.com/

Inquiries or to request additional services, contact the following:

Craig Alsheimer, Federal Account Manager

Computerized Facility Integrations, LLC

18000 West Nine Mile Road, Suite 700

Southfield, MI 48075

Email: calsheimer@gocfi.com

Phone: 248-557-4234 Extension 6010; 410-292-7006

D. Process:

1. Once the Contractor has been notified by VA of the award and a unique contract number, the Contractor can enter a request for access to TRIRIGA at URL https://valicensing.oncfi.com/

2. CFI will process the request for access and payment. CFI will create the USER ID and a password. Security provisions required to align the contractor to the Contract Number will be entered and an email will be generated and submitted to the requestor.

3. CFI will also provide standard terms and conditions related to the transaction and use agreement.

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SECTION 01 32 16.15
PROJECT SCHEDULES
(SMALL PROJECTS – DESIGN/BID/BUILD)

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 COR has the right to approve or disapprove the proposed consultant, and will notify the Contractor of the VA decision within 7 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 5 different reports (inclusive of all pages) available within the user-defined reports of the scheduling software approved by the COR; 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 COR shall identify the 5 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 be 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 10 calendar days from receipt of reports. The Contractor shall reprocess the computer-produced reports and associated diskette(s), when requested by the COR, to correct errors which affect the payment and schedule for the Project.

1.5 THE COMPLETE PROJECT SCHEDULE SUBMITTAL

A. Within 30 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the COR's review; 3 blueline copies of the interim schedule on sheets of paper 30 by 42 inches and an electronic file in the previously approved CPM schedule program. The submittal shall also include 3 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 COR. The Contractor shall make a separate written detailed request to the COR identifying these date constraints and secure the COR's written approval before incorporating them into the network diagram. The COR'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.

B. Within 30 calendar days after receipt of the complete Project interim Project Schedule and the complete final Project Schedule, the COR 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 jobsite 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 3 blueline copies of the revised Project Schedule, 3 copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the COR. The revised submission will be reviewed by the COR and, if found to be as previously agreed upon, will be approved.

E. The approved baseline schedule and the computer-produced schedule(s) generated therefrom shall constitute the approved baseline schedule until subsequently revised in accordance with the requirements of this Section.

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 COR 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. 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 preconstruction work.
   b. COR'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 5 workdays 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 5 trades who are performing major work under this contract.

3. Break up the work into activities/events of a duration no longer than 20 workdays 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 COR 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 workdays.

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 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 COR 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 COR. 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 COR’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 and 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 COR 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 COR 3 workdays 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 COR 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 resident engineer 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 resident engineer within 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, COR, and all subcontractors needed, as determined by the COR, 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 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 COR 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 COR for approval.

C. COR'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 COR.

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 COR 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 workdays) 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 COR'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 COR's decision.

C. The Contractor shall submit each request for a change in the Contract completion date to the COR 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 workdays) 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 REQUESTS FOR INFORMATION, 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 (including laboratory samples to be tested), 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 (COR), 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 Government. Time submission to assure adequate lead time for procurement of Contract-required items. Delays attributable to untimely and rejected submittals (including any laboratory samples to be tested) will not serve as a basis for extending Contract time for completion.

1-5 Submittals will be reviewed for compliance with Contract requirements by COR, or Architect-Engineer, and action thereon will be taken by COR on behalf of the Contracting Officer.

1-6 Upon receipt of submittals, COR, or 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 COR, 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 COR 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. COR assumes no responsibility for checking quantities or exact numbers included in such submittals.

A. Submit samples required by each Specification Section and the Finish Schedule on the Drawings, in quadruplicate. Submit other samples in single units unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and data, and certificates in quadruplicate, 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 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. In addition to complying with the applicable requirements specified in preceding Article 1.9, samples which are required to have Laboratory Tests (those preceded by symbol "LT" under the separate sections of the Specification shall be tested, at the expense of Contractor, in a commercial laboratory approved by COR.
   1. Laboratory shall furnish COR with a certificate stating that it is fully equipped and qualified to perform intended work, is fully acquainted with Specification requirements and intended use of materials and is an independent establishment in no way connected with organization of Contractor or with manufacturer or supplier of materials to be tested.
   2. Certificates shall also set forth a list of comparable projects upon which laboratory has performed similar functions during past 5 years.
   3. Samples and laboratory tests shall be sent directly to approved commercial testing laboratory.
   4. Contractor shall send a copy of transmittal letter to COR and to Architect-Engineer simultaneously with submission of material to a commercial testing laboratory.
   5. Laboratory test reports shall be sent directly to COR for appropriate action.
   6. Laboratory reports shall list Contract Specification test requirements and a comparative list of the laboratory test results. When tests show that the material meets Specification requirements, the laboratory shall so certify on test report.
   7. Laboratory test reports shall also include a recommendation for approval or disapproval of tested item.

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 COR 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 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 the COR under one cover.

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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 LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS FPMR PART 101-29 (FAR 52.211-1) (AUG 1998)

A. The GSA Index of Federal Specifications, Standards and Commercial Item Descriptions, FPMR Part 101-29 and copies of specifications, standards, and commercial item descriptions cited in the solicitation may be obtained for a fee by submitting a request to – GSA Federal Supply Service, Specifications Section, Suite 8100, 470 East L'Enfant Plaza, SW, Washington, DC 20407, Telephone (202) 619-8925, Facsimile (202) 619-8978.

B. If the General Services Administration, Department of Agriculture, or Department of Veterans Affairs issued this solicitation, a single copy of specifications, standards, and commercial item descriptions cited in this solicitation may be obtained free of charge by submitting a request to the addressee in paragraph (a) of this provision. Additional copies will be issued for a fee.

1.3 AVAILABILITY FOR EXAMINATION OF SPECIFICATIONS NOT LISTED IN THE GSA INDEX OF FEDERAL SPECIFICATIONS, STANDARDS AND COMMERCIAL ITEM DESCRIPTIONS (FAR 52.211-4) (JUN 1988)

The specifications and standards cited in this solicitation can be examined 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 a.m. - 3:00 p.m.

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.
http://www.aluminum.org

AABC Associated Air Balance Council
http://www.aabchq.com

AAMA American Architectural Manufacturer's Association
http://www.aamanet.org

AAN American Nursery and Landscape Association
http://www.anla.org

AASHTO American Association of State Highway and Transportation Officials
http://www.aashto.org

AATCC American Association of Textile Chemists and Colorists
http://www.aatcc.org

ACGIH American Conference of Governmental Industrial Hygienists
http://www.acgih.org

ACI American Concrete Institute
http://www.aci-int.net

ACPA American Concrete Pipe Association
http://www.concrete-pipe.org

ACPPA American Concrete Pressure Pipe Association
http://www.acppa.org

ADC Air Diffusion Council
http://flexibleduct.org

AGA American Gas Association
http://www.aga.org

AGC Associated General Contractors of America
http://www.agc.org

AGMA American Gear Manufacturers Association, Inc.
http://www.agma.org

AHAM Association of Home Appliance Manufacturers
http://www.aham.org

AISC American Institute of Steel Construction
http://www.aisc.org

AISI American Iron and Steel Institute
http://www.steel.org

AITC American Institute of Timber Construction
http://www.aitc-glulam.org

AMCA Air Movement and Control Association, Inc.
http://www.amca.org

ANLA American Nursery & Landscape Association
http://www.anla.org

ANSI American National Standards Institute, Inc.
http://www.ansi.org

APA The Engineered Wood Association
http://www.apawood.org

ARI Air-Conditioning and Refrigeration Institute
http://www.ari.org

ASAE American Society of Agricultural Engineers
http://www.asae.org

ASCE American Society of Civil Engineers
http://www.asce.org

ASHRAE American Society of Heating, Refrigerating, and Air-Conditioning Engineers
http://www.ashrae.org

ASME American Society of Mechanical Engineers
http://www.asme.org

ASSE American Society of Sanitary Engineering
http://www.asse-plumbing.org

ASTM American Society for Testing and Materials
http://www.astm.org

AWI Architectural Woodwork Institute
http://www.awinet.org

AWS American Welding Society
http://www.aws.org

AWWA American Water Works Association
http://www.awwa.org

BHMA Builders Hardware Manufacturers Association
http://www.buildershardware.com

BIA Brick Institute of America
http://www.bia.org

CAGI Compressed Air and Gas Institute
http://www.cagi.org

CGA Compressed Gas Association, Inc.
http://www.cganet.com

CI The Chlorine Institute, Inc.
http://www.chlorineinstitute.org

CISCA Ceilings and Interior Systems Construction Association
http://www.cisca.org

CISPI Cast Iron Soil Pipe Institute
http://www.cispi.org

CLFMI Chain Link Fence Manufacturers Institute
http://www.chainlinkinfo.org

CPMB Concrete Plant Manufacturers Bureau
http://www.cpmb.org

CRA California Redwood Association
http://www.calredwood.org

CRSI Concrete Reinforcing Steel Institute
http://www.crsi.org

CTI	Cooling Technology Institute http://www.cti.org
DHI	Door and Hardware Institute http://www.dhi.org
EGSA	Electrical Generating Systems Association http://www.egsa.org
EEI	Edison Electric Institute http://www.eei.org
EPA	Environmental Protection Agency http://www.epa.gov
ETL	ETL Testing Laboratories, Inc. http://www.et1.com
FAA	Federal Aviation Administration http://www.faa.gov
FCC	Federal Communications Commission http://www.fcc.gov
FPS	The Forest Products Society http://www.forestprod.org
GANA	Glass Association of North America http://www.cssinfo.com/info/gana.html/
FM	Factory Mutual Insurance http://www.fmglobal.com
GA	Gypsum Association http://www.gypsum.org
GSA	General Services Administration http://www.gsa.gov
HI	Hydraulic Institute http://www.pumps.org
HPVA	Hardwood Plywood & Veneer Association http://www.hpva.org

ICBO International Conference of Building Officials
http://www.icbo.org

ICEA Insulated Cable Engineers Association Inc.
http://www.icea.net

\ICAC Institute of Clean Air Companies
http://www.icac.com

IEEE Institute of Electrical and Electronics Engineers
http://www.ieee.org\

IMSA International Municipal Signal Association
http://www.imsasafety.org

IPCEA Insulated Power Cable Engineers Association

NBMA Metal Buildings Manufacturers Association
http://www.mbma.com

MSS Manufacturers Standardization Society of the Valve and Fittings Industry Inc.
http://www.mss-hq.com

NAAMM National Association of Architectural Metal Manufacturers
http://www.naamm.org

NAPHCC Plumbing-Heating-Cooling Contractors Association
http://www.phccweb.org.org

NBS National Bureau of Standards
See - NIST

NBBPVI National Board of Boiler and Pressure Vessel Inspectors
http://www.nationboard.org

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

NHLA National Hardwood Lumber Association
http://www.natlhardwood.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

RIS	Redwood Inspection Service See - CRA
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

WCLIB West Coast Lumber Inspection Bureau
6980 SW Varns Road, P.O. Box 23145
Portland, OR 97223
(503) 639-0651

WRCLA Western Red Cedar Lumber Association
P.O. Box 120786
New Brighton, MN 55112
(612) 633-4334

WWPA Western Wood Products Association
http://www.wwpa.org

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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 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.
   1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this Contract.
   2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features by marking, fencing, or using any other approved techniques.
      a. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
      b. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
   3. 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.
   4. Store chemical waste away from the work areas in corrosion-resistant containers and dispose of waste in accordance with Federal, State, and local regulations.

5. Handle discarded materials other than those included in the solid waste category as directed by the Contracting Officer's Representative (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.

D. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the jobsite.

1. 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 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 3 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 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
SCRAPERS	80	PILE DRIVERS	95
GRADERS	75	JACK HAMMERS	75
TRUCKS	75	ROCK DRILLS	80
PAVERS, STATIONARY	80	PNEUMATIC TOOLS	80

EARTHMOVING		MATERIALS HANDLING	PUMPS
	75	BLASTING	not permitted
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 5 successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure 50 feet from the noise source. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. 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 Cleanup: 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, matte 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. Salvage of existing materials and items for reuse or resale.
5. 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 (e.g., 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 (e.g., steel, wire, beverage containers, copper, etc.).
7. Cardboard, paper and packaging.
8. Bitumen roofing materials.
9. Plastics (e.g., 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, SELECTIVE 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. Construction/ demolition waste includes products of the following:

1. Excess or unusable construction materials.
2. Packaging used for construction products.
3. Poor planning and/or layout.
4. Construction error.
5. Over ordering.
6. Weather damage.
7. Contamination.
8. Mishandling.
9. Breakage.

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

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:

B. Prepare and submit to the Contracting Officer's Representative (COR) a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
   1. Procedures to be used for debris management.
   2. Techniques to be used to minimize waste generation.
   3. Analysis of the estimated jobsite waste to be generated.
      a. List of each material and quantity to be salvaged, reused, or recycled.
      b. List of each material and quantity proposed to be taken to a landfill.
   4. Detailed description of the Means/Methods to be used for material handling.
      a. On-Site: Material separation, storage, protection where applicable.
      b. Off-Site: Transportation means and destination. Include list of materials.
         1) Description of materials to be site-separated and self-hauled to designated facilities.
         2) Description of mixed materials to be collected by designated waste haulers and removed from the site.
      c. The names and locations of mixed debris reuse and recycling facilities or sites.
      d. The names and locations of trash disposal landfill facilities or sites.
      e. Documentation that the facilities or sites are approved to receive the materials.

C. Designated Manager responsible for instructing personnel, supervising, documenting and administer over meetings relevant to the Waste Management Plan.

D. Monthly summary of construction and demolition debris diversion and disposal, quantifying all materials generated at the work site and disposed of or diverted from disposal through recycling.

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 quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Records shall be kept in accordance with the LEED Reference Guide and LEED Template.

PART 2 - PRODUCTS

2.1 MATERIALS

A. List of each material and quantity to be salvaged, recycled, or reused.
B. List of each material and quantity proposed to be taken to a landfill.
C. Material tracking data: Receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, invoices, net total costs or savings.

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, dates removed, transportation costs, weight tickets, manifests, invoices. Include the net total costs or savings for each salvaged or recycled material.

C. Quantify all materials disposed of during the period with the receiving parties, dates removed, transportation costs, weight tickets, tipping fees, manifests, or invoices. Include the net total costs for each disposal.

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SECTION 02 41 00
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION:

This Section specifies demolition and removal of portions of existing buildings and utilities as required for the installation of new work.

1.2 RELATED WORK:

A. Safety Requirements: GENERAL CONDITIONS Article, ACCIDENT PREVENTION.

B. Disconnecting utility 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. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

E. Construction Waste Management: Section 017419 CONSTRUCTION WASTE MANAGEMENT.

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, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures. Comply with requirements of GENERAL CONDITIONS Article, ACCIDENT PREVENTION.

B. Provide safeguards, including warning signs, barricades, and other similar items that are required for protection of all personnel during demolition and removal operations.

C. In addition to previously listed fire and safety rules to be observed in performance of work, include following:

1. 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.

D. 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 Contracting Officer’s Representative (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.

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

1.4 JOB CONDITIONS:

A. The Owner will be continuously occupying the portions of the building outside Project limits. Coordinate all demolition work with COR in order to minimize disruptions to Owner's normal operations.

B. Do not interrupt existing utilities serving occupied portions of the building without permission from the COR. Provide temporary services as required by COR during interruptions to existing utilities.

PART 2 - PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 DEMOLITION:

A. Completely demolish and remove portions of structures, including all appurtenances related or connected thereto, as required and indicated in the Drawings. Notify COR immediately of any unanticipated mechanical, electrical or structural elements which are found in conflict with demolition activities or new work.

B. Debris, including concrete masonry unit, 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 debris in compliance with applicable federal, state or local permits, rules and/or regulations.

3.2 CLEANUP:

On completion of work of this Section and after removal of all debris, leave site in clean condition satisfactory to COR. Cleanup shall include off the Medical Center 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.

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SECTION 03 30 53
(SHORT-FORM) CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION:

This Section specifies cast-in-place structural concrete and material and mixes for other concrete.

1.2 RELATED WORK:

A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.

1.3 TOLERANCES:

A. ACI 117.

1.4 REGULATORY REQUIREMENTS:

A. ACI SP-66 ACI Detailing Manual.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

1.5 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Concrete Mix Design.

1.6 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 Concrete Institute (ACI):

117-10.....Specification for Tolerances for Concrete Construction, Materials and Commentary

211.1-91(R2009).....Standard Practice for Proportions for Normal, Heavyweight, and Mass Concrete

211.2-98(R2004).....Standard Practice for Selecting Proportions for Structural Lightweight Concrete

301-10.....Specifications for Structural Concrete

305.1-06.....Specification for Hot Weather Concreting

306.1-90(R2002).....Standard Specification for Cold Weather Concreting

SP-66-04 .....ACI Detailing Manual

318-11.....Building Code Requirements for Structural Concrete and Commentary

347-04.....Guide to Formwork for Concrete

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

A185/A185M-07.....Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete Reinforcement

A615/A615M-09.....Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement

A996/A996M-09.....Standard Specification for Rail Steel and Axle Steel Deformed Bars for Concrete Reinforcement

C31/C31M-10.....Standard Practice for Making and Curing Concrete Test Specimens in the Field

C33/C33M-11a.....Standard Specification for Concrete Aggregates

C39/C39M-12.....Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

C94/C94M-12.....Standard Specification for Ready Mixed Concrete

C143/C143M-10.....Standard Test Method for Slump of Hydraulic Cement Concrete

C150-11.....Standard Specification for Portland Cement

C171-07.....Standard Specification for Sheet Material for Curing Concrete

C172-10.....Standard Practice for Sampling Freshly Mixed Concrete

C173-10.....Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

C192/C192M-07.....Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

C231-10.....Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

C260-10.....Standard Specification for Air-Entraining Admixtures for Concrete

C330-09.....Standard Specification for Lightweight Aggregates for Structural Concrete

C494/C494M-11.....Standard Specification for Chemical Admixtures for Concrete

C618-12.....Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

D1751-04(R2008) .....Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)

D4397-10.....Standard Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications

E1155-96(2008).....Standard Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers

PART 2 - PRODUCTS

2.1 FORMS:

Wood, plywood, metal, or other materials, approved by Resident Engineer, of grade or type suitable to obtain type of finish specified.

2.2 MATERIALS:

A. Portland Cement: ASTM C150, Type I or II.

B. Fly Ash: ASTM C618, Class C or F including supplementary optional requirements relating to reactive aggregates and alkalis, and loss on ignition (LOI) not to exceed 5 percent.

C. Coarse Aggregate: ASTM C33, Size 67. Size 467 may be used for footings and walls over 12 inches thick. Coarse aggregate for applied topping and metal pan stair fill shall be Size 7.

D. Fine Aggregate: ASTM C33.

E. Lightweight Aggregate for Structural Concrete: ASTM C330, Table 1.

F. Mixing Water: Fresh, clean, and potable.

G. Air-Entraining Admixture: ASTM C260.

H. Chemical Admixtures: ASTM C494.

I. Reinforcing Steel: ASTM A615 or ASTM A996, deformed. See Structural Drawings for grade.

J. Welded Wire Fabric: ASTM A185.

K. Expansion Joint Filler: ASTM D1751.

L. Sheet Materials for Curing Concrete: ASTM C171.

M. Liquid Hardener and Dustproofer: Fluosilicate solution or magnesium fluosilicate or zinc fluosilicate. Magnesium and zinc may be used separately or in combination as recommended by manufacturer.

N. Liquid Densifier/Sealer: 100 percent active colorless aqueous siliconate solution.

2.3 CONCRETE MIXES:

A. Design of concrete mixes using materials specified shall be the responsibility of the Contractor as set forth under Option C of ASTM C94.

B. Compressive strength at 28 days shall be not less than 4,000 psi for normal weight concrete and 3,000 psi for lightweight concrete.

C. Establish strength of concrete by testing prior to beginning concreting operation. Test consists of average of 3 cylinders made and cured in accordance with ASTM C192 and tested in accordance with ASTM C39.

D. Maximum slump for vibrated concrete is 4 inches tested in accordance with ASTM C143.

E. Cement and water factor (See Table I):

1. Lightweight structural concrete. Pump mixes may require higher cement values.
2. Determined by laboratory in accordance with ACI 211.1 for normal concrete or ACI 211.2 for lightweight structural concrete.

TABLE I - CEMENT AND WATER FACTORS FOR CONCRETE

Concrete: Strength	Non-Air-Entrained		Air-Entrained	
Min. 28-Day Comp. Str. psi	Min. Cement lbs/c. yd.	Max. Water Cement Ratio	Min. Cement lbs/c. yd.	Max. Water Cement Ratio
4,000	550	0.55	570	0.50
3,000	500	*	520	*

F. Air-entrainment is required for all exterior concrete. Air content shall conform to the following tables:

TABLE I - TOTAL AIR CONTENT
FOR VARIOUS SIZES OF COARSE AGGREGATES (NORMAL CONCRETE)

Nominal Maximum Size of Coarse Aggregate	Total Air Content Percentage by Volume
3/8-inch	6 to 10
½-inch	5 to 9
¾-inch	4 to 8
1 inch	3-1/2 to 6-1/2
1-1/2 inches	3 to 6

TABLE II - TOTAL AIR CONTENT
AIR CONTENT OF LIGHTWEIGHT STRUCTURAL CONCRETE

Nominal Maximum Size of Total Air Content	Coarse Aggregate, Inches Percentage by Volume
Great than 3/8-inch 4 to 8	3/8-inch or less 5 to 9

2.4 BATCHING AND MIXING:

A. Store, batch, and mix materials as specified in ASTM C94.

1. Ready-Mixed: Ready-mixed concrete comply with ASTM C94, except use of non-agitating equipment for transporting concrete to the site will not be permitted. With each load of concrete delivered to Project, ready-mixed concrete producer shall furnish, in duplicate, certification as required by ASTM C94.
2. Mixing Structural Lightweight Concrete: Charge mixer with 2/3 of total mixing water and all of the aggregate. Mix ingredients for not less than 30 seconds in a stationary mixer or not less than 10 revolutions at mixing speed in a truck mixer. Add remaining mixing water and other ingredients and continue mixing. Above procedure may be modified as recommended by aggregate producer.

PART 3 - EXECUTION

3.1 FORMWORK:

A. Installation conforms to ACI 347. Sufficiently tight to hold concrete without leakage, sufficiently braced to withstand vibration of concrete, and to carry, without appreciable deflection, all dead and live loads to which they may be subjected.

B. Treating and Wetting: Treat or wet contact forms as follows:

1. Coat plywood and board forms with non-staining form sealer. In hot weather, cool forms by wetting with cool water just before concrete is placed.
2. Clean and coat removable metal forms with light form oil before reinforcement is placed. In hot weather, cool metal forms by thoroughly wetting with water just before placing concrete.
3. Use sealer on reused plywood forms as specified for new material.

C. Inserts, Sleeves, and Similar Items: Masonry ties, anchors, inserts, wires, hangers, sleeves, boxes for floor hinges and other items specified as furnished under this and other Sections of Specifications and required to be in their final position at the time concrete is placed shall be properly located, accurately positioned and built into construction, and maintained securely in place.

D. Construction Tolerances:

1. Contractor is responsible for setting and maintaining concrete formwork to assure erection of completed work within tolerances specified to accommodate installation or other rough and finish materials. Remedial work necessary for correcting excessive tolerances is the responsibility of the Contractor. Erected work that

exceeds specified tolerance limits shall be remedied or removed and replaced, at no additional cost to the Government.

2. Permissible surface irregularities for various classes of materials are defined as "finishes" in Specification Sections covering individual materials. They are to be distinguished from tolerances specified which are applicable to surface irregularities of structural elements.

3.2 REINFORCEMENT:

A. Details of concrete reinforcement, unless otherwise shown, in accordance with ACI 318 and ACI SP-66. Support and securely tie reinforcing steel to prevent displacement during placing of concrete.

3.3 VAPOR BARRIER:

A. Except where membrane waterproofing is required, place interior concrete slabs on a continuous vapor barrier, to match existing.

B. Lap joints 6 inches, and seal with a compatible pressure-sensitive tape.

C. Patch punctures and tears.

3.4 PLACING CONCRETE:

A. Before placing new concrete on or against concrete which has set, existing surfaces shall be roughened and cleaned free from all laitance, foreign matter, and loose particles.

B. Convey concrete from mixer to final place of deposit by method which will prevent segregation or loss of ingredients. Do not deposit in work concrete that has attained its initial set or has contained its water or cement more than 1-1/2 hours. Do not allow concrete to drop freely more than 5 feet in unexposed work or more than 3 feet in exposed work. Place and consolidate concrete in horizontal layers not exceeding 12 inches in thickness. Consolidate concrete by spading, rodding, and mechanical vibrator. Do not secure vibrator to forms or reinforcement. Vibration shall be carried on continuously with placing of concrete.

C. Hot Weather Placing of Concrete: Follow recommendations of ACI 305R to prevent problems in the manufacturing, placing, and curing of concrete that can adversely affect the properties and serviceability of the hardened concrete.

D. Cold weather placing of concrete: Follow recommendations of ACI 306R, to prevent freezing of thin sections less than 12 inches and to permit concrete to gain strength properly, except that use of calcium chloride shall not be permitted without written approval from Contracting Officer’s Representative (COR).

3.5 PROTECTION AND CURING:

Protect exposed surfaces of concrete from premature drying, wash by rain or running water, wind, mechanical injury, and excessively hot or cold temperature. Curing method shall be subject to approval by COR.

3.6 FORM REMOVAL:

Forms remain in place until concrete has a sufficient strength to carry its own weight and loads supported. Removal of forms at any time is the Contractor's sole responsibility.

3.7 SURFACE PREPARATION:

Immediately after forms have been removed and work has been examined and approved by COR, remove loose materials, and patch all stone pockets, surface honeycomb, or similar deficiencies with cement mortar made with 1 part portland cement and 2 to 3 parts sand.

3.8 FINISHES:

A. Vertical and Overhead Surface Finishes:

1. Unfinished Areas: Vertical and overhead concrete surfaces exposed in unfinished areas, above suspended ceilings in manholes, and other unfinished areas exposed or concealed will not require additional finishing.
2. Interior and Exterior Exposed Areas (to be painted): Fins, burrs and similar projections on surface shall be knocked off flush by mechanical means approved by COR and rubbed lightly with a fine abrasive stone or hone. Use an ample amount of water during rubbing without working up a lather of mortar or changing texture of concrete.

B. Slab Finishes:

1. Scratch Finish: Slab surfaces to receive a bonded, applied cementitious application shall all be thoroughly raked or wire broomed after partial setting (within 2 hours after placing) to roughen surface to insure a permanent bond between base slab and applied cementitious materials.
2. Floating: Allow water brought to surface by float used for rough finishing to evaporate before surface is again floated or troweled. Do not sprinkle dry cement on surface to absorb water.
3. Float Finish: Ramps, stair treads, and platforms, both interior and exterior, equipment pads, and slabs to receive non-cementitious materials, except as specified, shall be screened and floated to a smooth dense finish. After first floating, while surface is still soft, surfaces shall be checked for alignment using a straightedge or

template. Correct high spots by cutting down with a trowel or similar tool and correct low spots by filling in with material of same composition as floor finish. Remove any surface projections on floated finish by rubbing or dry grinding. Refloat the slab to a uniform sandy texture.

4. Steel Trowel Finish: Applied toppings, concrete surfaces to receive resilient floor covering or carpet, and all monolithic concrete floor slabs exposed in finished work and for which no other finish is shown or specified shall be steel troweled. Final steel troweling to secure a smooth, dense surface shall be delayed as long as possible, generally when the surface can no longer be dented with finger. During final troweling, tilt steel trowel at a slight angle and exert heavy pressure on trowel to compact cement paste and form a dense, smooth surface. Finished surface shall be free of trowel marks, uniform in texture and appearance.

3.9 SURFACE TREATMENTS:

A. Surface treatments shall be mixed and applied in accordance with manufacturer's printed instructions.

B. Liquid Densifier/Sealer: Use on all exposed concrete floors and concrete floors to receive carpeting, except those specified to receive non-slip finish.

3.10 RESURFACING FLOORS:

A. Remove existing flooring, in areas to receive resurfacing, to expose existing structural slab and to extend not less than 1 inch below new finished floor level. Prepare exposed structural slab surface by roughening, broom cleaning, wetting, and grouting. Apply lightweight concrete topping as specified and indicated on the Drawings. Float and steel trowel topping to a hard, smooth finish.

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SECTION 05 40 00
COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This Section specifies materials and services required for installation of cold-formed steel, including tracks and required accessories as shown and specified. This Section includes the following:

1. Interior load-bearing steel stud walls.

2. Steel joists.

1.2 RELATED WORK:

A. Non-Load-Bearing Metal Stud Framing Assemblies: Section 09 22 16, NON-STRUCTURAL METAL FRAMING.

B. Gypsum Board Assemblies: Section 09 29 00, GYPSUM BOARD.

1.3 DESIGN REQUIREMENTS:

A. Design steel in accordance with American Iron and Steel Institute Publication "Specification for the Design of Cold-Formed Steel Structural Members," except as otherwise shown or specified.

B. Structural Performance: Engineer, fabricate, and erect cold-formed metal framing to withstand design loads within limits and under conditions required.

1. Design Loads: As indicated.

2. Design framing systems to withstand design loads without deflections greater than the following:

a. Interior Load-Bearing Walls: Lateral deflection of 1/240 of the wall height.

b. Ceiling Joists: Vertical deflection of 1/240 of the span.

3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change (range) of 120 degrees F.

4. Design framing system to accommodate deflection of primary building structure and construction tolerances, and to maintain clearances at openings.

5. Engineering Responsibility: Engage a fabricator who assumes undivided responsibility for engineering cold-formed metal framing by employing a qualified professional engineer to prepare design calculations, shop drawings, and other structural data.

1.4 SUBMITTALS:

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings: Shop and erection drawings showing steel unit layout, connections to supporting members, and information necessary to complete installation as shown and specified.

C. Manufacturer's Literature and Data: Showing steel component sections and specifying structural characteristics.

D. For cold-formed metal framing indicated to comply with certain design loadings, include structural analysis data sealed and signed by the qualified professional engineer who was responsible for its preparation.

1.5 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 Iron and Steel Institute (AISI):

Specification and Commentary for the Design of Cold-Formed Steel Structural Members (1996)

C. American Society of Testing and Materials (ASTM):

A36/A36M-08.....Standard Specifications for Carbon Structural Steel

A123/A123M-09.....Standard Specifications for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A153/A153M-09.....Standard Specifications for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

A307-10.....Standard Specifications for Carbon Steel Bolts and Studs

A653/A653M-10.....Standard Specifications for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

C1107/C1107M-08.....Standard Specifications for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)

E488-96(R2003).....Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements

E1190-95(R2007).....Standard Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members

D. American Welding Society (AWS):

D1.3/D1.3M-08.....Structural Welding Code-Sheet Steel

E. Military Specifications (Mil. Spec.):

MIL-P-21035B.....Paint, High Zinc Dust Content, Galvanizing Repair

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Sheet steel for joists, studs and accessories 16 gage and heavier: ASTM A653, structural steel, zinc-coated G60, with a yield of 340 MPa minimum.

B. Sheet Steel for joists, studs and accessories 18 gage and lighter: ASTM A653, structural steel, zinc-coated G60, with a yield of 230 MPa minimum.

C. Galvanizing Repair Paint: MIL-P-21035B.

2.2 WALL FRAMING:

A. Steel Studs: Manufacturer’s standard C-shaped steel studs of web depth indicated, with lipped flanges, and complying with the requirements shown on the Drawings.

B. Steel Track: Manufacturer’s standard U-shaped steel track, unpunched, of web depths indicated, with straight flanges, and complying with the following:

1. Design Uncoated-Steel Thickness: Matching steel studs.

2. Flange Width: Manufacturer’s standard deep flange where indicated, standard flange elsewhere.

2.3 JOIST FRAMING:

A. Steel Joists: Manufacturer’s standard C-shaped steel joists, unpunched, of web depths indicated, with lipped flanges, and complying with the requirements indicated on the Drawings.

B. Steel Joist Track: Manufacturer’s standard U-shaped steel joist track, unpunched, of web depths indicated, with straight flanges, and complying with the following:

1. Design Uncoated-Steel Thickness: Matching steel joists.

2.4 FRAMING ACCESSORIES:

A. Fabricate steel framing accessories of the same material and finish used for framing members, with minimum yield strength of 230 MPa.

B. Provide accessories of manufacturer’s standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.

2. Bracing, bridging, and solid blocking.

3. Web stiffeners.

4. Gusset plates.

5. Deflection track and vertical slide clips.

6. Stud kickers and girts.

7. Joist hangers and end closures.

8. Reinforcement plates.

2.5 ANCHORS, CLIPS, AND FASTENERS:

A. Steel Shapes and Clips: ASTM A36, zinc coated by the hot-dip process according to ASTM A123.

B. Cast-in-Place Anchor Bolts and Studs: ASTM A307, Grade A, zinc coated by the hot-dip process according to ASTM A153.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times the

design load, as determined by testing per ASTM E488 conducted by a qualified independent testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times the design load, as determined by testing per ASTM E1190 conducted by a qualified independent testing agency.

E. Mechanical Fasteners: Corrosion-resistant coated, self-drilling, self-threading steel drill screws. Low-profile head beneath sheathing, manufacturer’s standard elsewhere.

2.6 REQUIREMENTS:

A. Welding in accordance with AWS D1.3

B. Furnish members and accessories by one manufacturer only.

PART 3 - EXECUTION

3.1 FABRICATION:

A. Framing components may be preassembled into panels. Panels shall be square with components attached.

B. Cut framing components squarely or as required for attachment. Cut framing members by sawing or shearing; do not torch cut.

C. Hold members in place until fastened.

D. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

1. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

2. Locate mechanical fasteners and install according to cold-formed metal framing manufacturer’s instructions with screw penetrating joined members by not less than 3 exposed screw threads.

E. Where required, provide specified insulation in double-header members and double-jamb studs which will not be accessible after erection.

3.2 ERECTION:

A. Handle and lift prefabricated panels in a manner as to not distort any member.

B. Securely anchor tracks to supports as shown.

C. At butt joints, securely anchor 2 pieces of track to same supporting member or butt-weld or splice together.

D. Plumb, align, and securely attach studs to flanges or webs of both upper and lower tracks.

E. All axially loaded members shall be aligned vertically to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at floor/wall intersections.

F. Install jack studs above and below openings and as required to furnish support. Securely attach jack studs to supporting members.

G. Install headers in all openings that are larger than the stud spacing in that wall.

H. Attach bridging for studs in a manner to prevent stud rotation. Space bridging rows as shown.

I. Studs in one piece for their entire length, splices will not be permitted.

J. Provide a load distribution member at top track where joist is not located directly over bearing stud.

K. Provide joist bridging and web stiffeners at reaction points where shown.

L. Provide end blocking where joist ends are not restrained from rotation.

M. Provide an additional joist under parallel partitions, unless otherwise shown, when partition length exceeds one-half joist span and when floor and roof openings interrupt one or more spanning members.

N. Provide temporary bracing and leave in place until framing is permanently stabilized.

O. Do not bridge building expansion joints with cold-formed metal framing. Independently frame both sides of joints.

P. Fasten reinforcement plate over web penetrations that exceed size of manufacturer’s standard punched openings.

3.3 TOLERANCES:

A. Vertical alignment (plumbness) of studs shall be within 1/960th of the span.

B. Horizontal alignment (levelness) of walls shall be within 1/960th of their respective lengths.

C. Spacing of studs shall not be more than 1/8-inch +/- from the designed spacing providing that the cumulative error does not exceed the requirements of the finishing materials.

D. Prefabricated panels shall be not more than 1/8-inch +/- out of square within the length of that panel.

3.4 FIELD REPAIR:

Touch up damaged galvanizing with galvanizing repair paint.

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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
2. Frames
3. Steel support angles
4. Loose lintels
5. Railings

1.2 RELATED WORK

A. Colors, finishes, and textures as indicated in the Finish Schedule on the Drawings.

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.
2. Mark items requiring field assembly for erection identification and furnish erection drawings and instructions.
3. Provide templates and rough-in measurements as required.

C. Furnish setting drawings and instructions for installation of anchors to be preset into concrete and masonry work, and for the positioning of items having anchors to be built into concrete or masonry construction.

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. Assembled product to the greatest extent possible before delivery to the 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

A47-99(R2009).....Malleable Iron Castings

A48-03(R2012).....Gray Iron Castings

A53-12.....Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless

A123-12.....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

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

A269-10.....Seamless and Welded Austenitic Stainless-Steel Tubing for General Service

A307-12.....Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength

A391/A391M-07(R2012)....Grade 80 Alloy Steel Chain

A786/A786M-09.....Rolled Steel Floor Plate

B221-13.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

B456-11.....Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium

B632-08.....Aluminum-Alloy Rolled Tread Plate

C1107-13.....Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

D3656-13.....Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns

F436-11.....Hardened Steel Washers

F468-06(R2012).....Nonferrous Bolts, Hex Cap Screws, Socket Head Cap Screws, and Studs for General Use

F593-13.....Stainless-Steel Bolts, Hex Cap Screws, and Studs

F1667-11.....Driven Fasteners: Nails, Spikes and Staples

D. American Welding Society (AWS):
D1.1-10.....Structural Welding Code Steel
D1.2-08.....Structural Welding Code Aluminum
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
MBG 531-09.....Metal Bar Grating Manual
MBG 532-09.....Heavy-Duty Metal Bar Grating 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

A. In addition to the dead loads, design fabrications to support the following live loads unless otherwise specified.

B. Railings and Handrails: 200 pounds in any direction at any point.

2.2 MATERIALS

A. Structural Steel: ASTM A36.

B. Primer Paint: As specified in Section 09 91 00, PAINTING.

C. 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 0.0125-inch-thick stainless steel.

D. 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 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.
4. Nails: ASTM F1667, Type I, style 6 or 14 for finish work.

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 service ability 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 member’s 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.

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: Use appropriate anchors, as applicable to conditions and materials, and as indicated on the Drawings, for related loads, in compliance with applicable standards and regulations.
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 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, G90 unless noted otherwise.
   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: 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 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 0.0598-inch thick.
3. Steel strip minimum of 6 inches wide, length extending one stud space beyond end of item supported.
4. Steel hat channels where shown. Flange cut and flatted for anchorage to stud.
5. Structural-steel tube or channel for grab bar at water closets floor to structure above with clip angles or end plates formed for anchors.
6. Use steel angles for through-wall counters. Drill angle for fasteners at ends and not over 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 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. Stainless-steel ceiling plate drilled for eye bolt.
5. Continuously weld connections where welds shown.
6. Use modular channel where shown with manufacturer’s 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 manufacturer’s standard fittings.

D. For Operating Room Light:
1. Fabricate as shown to suit equipment furnished.
2. Drill leveling plate for light fixture bolts.

2.6 LOOSE LINTELS

A. Furnish lintels of sizes shown. Where size of lintels is not shown, provide the sizes specified.
B. Fabricate lintels with not less than 6-inch bearing at each end for nonbearing masonry walls, and 8-inch bearing at each end for bearing walls.
C. Provide one angle lintel for each 4 inches of masonry thickness as follows except as otherwise specified or shown.
1. Openings 2-1/2 feet to 6 feet - 4 by 3-1/2 by 5/16-inch.
2. Openings 6 feet to 10 feet - 6 by 3-1/2 by 3/8-inch.

D. For 6-inch-thick masonry openings 2-1/2 feet to 10 feet, use one angle 6 by 3-1/2 by 3/8-inch.
E. Provide bearing plates for lintels where shown.
F. Weld or bolt upstanding legs of double angle lintels together with 3/4-inch bolts spaced at 12 inches on centers.
G. Insert spreaders at bolt points to separate the angles for insertion of metal windows, louver, and other anchorage.
H. Where shown or specified, punch upstanding legs of single lintels to suit size and spacing of anchor bolts.

2.7 SUPPORT ANGLES

A. Fabricate from steel angles of size shown.

B. Fabricate angles with horizontal slotted holes for 3/4-inch bolts spaced at not over 3 feet on centers and within 12 inches of ends.

2.8 RAILINGS

A. In addition to the dead load design railing assembly to support live load specified.

B. Fabrication General:

1. Provide continuous welded joints, dressed smooth and flush.
2. Standard flush fittings, designed to be welded, may be used.
3. Exposed threads will not be approved.
4. Form handrail brackets to size and design shown.
5. Exterior Post Anchors.
   a. Fabricate tube or pipe sleeves with closed ends or plates as shown.
   b. Where inserts interfere with reinforcing bars, provide flanged fittings welded or threaded to posts for securing to concrete with expansion bolts.
   c. Provide heavy pattern sliding flange base plate with set screws at base of pipe or tube posts. Base plates are not required on pipe sleeves where ornamental railings occur.
6. Post Anchors:
   a. Provide flanged fittings for securing fixed posts to floor with expansion bolts, unless shown otherwise.
   b. Weld or thread flanged fitting to posts at base.
   c. For securing removable posts to floor, provide close fitting sleeve insert or inverted flange base plate with stud bolts or rivets concrete anchor welded to the base plate.
   d. Provide sliding flange base plate on posts secured with set screws.

C. Handrails:

1. Close free ends of rail with flush metal caps welded in place except where flanges for securing to walls with bolts are shown.
2. Make provisions for attaching handrail brackets to wall, posts, and handrail as shown.

D. Steel Pipe Railings:

1. Fabricate of steel pipe with welded joints.
2. Number and space of rails as shown.
3. Space posts for railings not over 6 feet on centers between end posts.
4. Form handrail brackets from malleable iron.

5. Fabricate removable sections with posts at end of section.
6. Opening Guardrails:
   a. Fabricate rails with flanged fitting at each end to fit between wall opening jambs.
   b. Design flange fittings for fastening with machine screws to steel plate anchored to jambs.
   c. Fabricate rails for floor openings for anchorage in sleeves.

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. Isolate aluminum from dissimilar metals and from contact with concrete and masonry materials as required to prevent electrolysis and corrosion.
G. 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.

C. Ceiling Support for Operating Observation Light:
1. Anchor support to structure above as shown.
2. Set leveling plate as shown level with ceiling.
3. Secure light to leveling plate in accordance with light manufacturer's requirements.

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 STEEL LINTELS

A. Use lintel sizes and combinations shown or specified.

B. Install lintels with longest leg upstanding, except for openings in 6-inch masonry walls, install lintels with longest leg horizontal.

C. Install lintels to have not less than 6-inch bearing at each end for nonbearing walls, and 8-inch bearing at each end for bearing walls.

3.4 SUPPORT ANGLES

A. Anchor support angles with 3/4-inch bolts unless shown otherwise in adjustable malleable iron inserts, set level at elevation shown.

B. Provide expansion space at end of members.

3.5 RAILINGS

A. Steel Posts:
1. Secure fixed posts to concrete with expansion bolts through flanged fittings except where sleeves are shown with pourable grout.
2. Install sleeves in concrete formwork.
3. Set post in sleeve and pour grout to surface. Apply beveled bead of urethane sealant at perimeter of post or under flange fitting as specified in Section 07 92 00, JOINT SEALANTS—on exterior posts.

4. Secure sliding flanged fittings to posts at base with set screws.
5. Secure fixed flanged fittings to concrete with expansion bolts.
6. Secure posts to steel with welds.

B. Anchor to Walls:
1. Anchor rails to concrete or solid masonry with machine screws through flanged fitting to steel plate.
   a. Anchor steel plate to concrete or solid masonry with expansion bolts.
   b. Anchor steel plate to hollow masonry with toggle bolts.
2. Anchor flanged fitting with toggle bolt to steel support in frame walls.

C. Handrails:
1. Anchor brackets for metal handrails as detailed.
2. Install brackets within 12 inches of return of walls, and at evenly spaced intermediate points not exceeding 4 feet on centers unless shown otherwise.
3. Expansion bolt to concrete or solid masonry.
4. Toggle bolt to installed supporting frame wall and to hollow masonry unless shown otherwise.

3.19 CLEANING 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 and items fabricated from stainless steel, aluminum and copper alloys, as recommended by the metal manufacture and protected from damage until completion of the Project.

- - - E N D - - -

SECTION 06 20 00
FINISH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies interior millwork.

B. Items Specified:

1. Counter or Work Tops
2. Mounting Strips, Shelves, and Rods

1.2 RELATED WORK

A. Fabricated Metal Brackets and Countertop Legs: Section 05 50 00, METAL FABRICATIONS.

B. Wood Doors: Section 08 14 00, WOOD DOORS.

D. Color and Texture of Finish: As indicated in the Finish Schedule on the Drawings.

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, 6 by 12 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. Manufacturer's Literature and Data:

1. Finish hardware.
2. Sinks with fittings.
3. Electrical components.

1.4 DELIVERY, STORAGE AND HANDLING

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

B. Store finishing lumber and millwork in weathertight, well-ventilated structures or in space in existing buildings designated by Contracting Officer’s Representative (COR). Store at a minimum temperature of 70 degrees 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
A53-12.....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. Hardwood Plywood and Veneer Association (HPVA):
HP1-09.....Hardwood and Decorative Plywood

F. American Wood-Preservers’ Association (AWPA):
AWPA C1-03.....All Timber Products – Preservative Treatment by Pressure Processes

G. Architectural Woodwork Institute (AWI):
AWI-09.....Architectural Woodwork Quality Standards and 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):
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

A-A-1936.....Contact Adhesive

FF-N-836D.....Nut, Square, Hexagon Cap, Slotted, Castle

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

MM-L-736(C).....Lumber, Hardwood

PART 2 – PRODUCTS

2.1 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, Standing and Running Trim, and Rails: Actual size as shown or specified.

C. Hardwood: MM-L-736, species as specified for each item.

D. Softwood: PS-20, exposed to view appearance grades:
   1. Use C select or D select, vertical grain for transparent finish including stain transparent finish.
   2. Use prime for painted or opaque finish.

2.2 PLYWOOD

A. Softwood Plywood:
   1. Production standard.
   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, 1/2-inch and thicker; not less than 5-ply construction, except 1-1/4-inch-thick plywood not less than 7-ply.

4. Plastic Laminate Plywood Cores:
   a. Exterior type, and species group.
   b. Veneer Grade: A-C.
5. Shelving Plywood:
   a. Interior type, any species group.
   b. Veneer Grade: A-B or B-C.
6. Other: As specified for item.

B. Hardwood Plywood:
1. HPVA: HP.1
2. Species of face veneer shall be as shown or as specified in connection with each particular item.
3. Inside of Building:
   a. Use Type II (interior), A-grade veneer for transparent finish.
4. Use wood species and cut, matching existing wood products.

2.3 PARTICLEBOARD

A. The use of particleboard or plastic laminated particleboard cores is not allowed.

2.4 PLASTIC LAMINATE

A. NEMA LD-3.

B. Exposed decorative surfaces including countertops, 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 particleboard.

D. Backing sheet on bottom of plastic-laminate-covered wood tops: Backer, Type HGP.

E. Post Forming Fabrication, Decorative Surfaces: Post forming, Type HGP.

2.5 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.

2.6 STAINLESS STEEL

A. ASTM A167, Type 302 or 304.

2.7 ALUMINUM CAST

A. ASTM B26.

2.8 ALUMINUM EXTRUDED

A. ASTM B221

2.9 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. Use galvanized coating on ferrous metal for exterior work unless non-ferrous metals or stainless is used.
3. 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 6 inches deep, B05052 for drawers 3 to 6 inches deep, and B05053 for drawers less than 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.
   f. Butt Hinges: B01361 for flush doors, B01381 for inset lipped doors, and B01521 for overlay doors.
   g. Cabinet Door Catch: B0371 or B03172.
   h. Vertical-Slotted Shelf Standard: B04103 with shelf brackets B04113, sized for shelf depth.
2. Cabinet Locks: ANSI A156.11.
   a. Drawers and Hinged Door: E07262.
   b. Sliding Door: E07162.
3. Auxiliary Hardware: ANSI A156.16.
   a. Shelf Bracket: B04041, japanned or enameled finish.
   b. Combination Garment rod and Shelf Support: B04051 japanned or enamel finish.
   c. Closet Bar: L03131 chrome finish of required length.
   d. Handrail Brackets: L03081 or L03101.
      1) Cast aluminum, satin polished finish.
      2) Cast malleable iron, japanned or enamel finish.
4. Steel Channel Frame and Leg Supports for Countertop: Fabricated under Section 05 50 00, METAL FABRICATIONS.

5. Pipe Bench Supports:
   a. Pipe: ASTM A53.
6. Fabricated Wall Bench Supports:
   a. Steel Angles: ASTM A36 steel with chrome finish, or ASTM A167, stainless steel with countersunk wood screws, holes at 2-1/2 inches on center on horizontal member.
   b. Use 1-1/2- by 1-1/2- by 3/16-inch angle thick drilled for screw and bolt holes unless shown otherwise. Drill 1/4-inch holes for anchors on vertical member, not more than 8 inches on center between ends or corners.
   c. Stainless-Steel Bar Brackets: ASTM A167, fabricated to shapes shown, Number 4 finish. Use 2-inch by 3/16-inch bars unless shown otherwise. Drill for anchors and screws. Drill countersunk wood screw holes at 2-1/2 inches on center on horizontal members and not less than two 1/4-inch holes for anchors on vertical member.
7. Through-Wall Counter Brackets:
   a. Steel angles drilled for fasteners on 4-inch centers.
   b. Baked enamel prime coat finish.
8. Edge Strips Moldings:
   a. Driven Type "T" shape with serrated retaining stem; vinyl plastic to match plastic laminate color, stainless steel, or 1/8-inch-thick extruded aluminum.
   b. Stainless steel or extruded aluminum channels.
   c. Stainless steel, number 4 finish; aluminum, mechanical applied medium satin finish, clear anodized 0.4 mils thick.
9. Rubber or Vinyl Molding:
   a. Rubber or vinyl standard stock and in longest lengths practicable.
   b. Design for closures at joints with walls and adhesive anchorage.
   c. Adhesive as recommended by molding manufacturer.
10. Primers: Manufacturer's standard primer for steel providing baked enamel finish.

2.10 MOISTURE CONTENT

A. Moisture content of lumber and millwork at time of delivery to site.
   1. Interior finish lumber, trim, and millwork 1-1/4 inches or less in nominal thickness: 12 percent on 85 percent of the pieces and 15 percent on the remainder.
   2. Exterior treated or untreated finish lumber and trim 4 inches or less in nominal thickness: 15 percent.

3. Moisture content of other materials shall be in accordance with the standards under which the products are produced.

2.11 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 and smoke developed 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.
      b. Smoke Developed: 100 maximum

2.12 PRESERVATIVE TREATMENT

A. Wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including wood members used for rough framing of millwork items except heart-wood Redwood and Western Red Cedar shall be preservative treated in accordance with AWPA Standards.
B. Use Grade exterior plywood for treatment.

2.13 FABRICATION

A. General:
   1. Except as otherwise specified, use AWI Custom Grade for architectural woodwork and interior millwork.
   2. Finish woodwork shall be free from pitch pockets.
   3. Except where special profiles are shown, trim shall be standard stock molding and members of the same species.
   4. Plywood shall be not less than 1/2-inch unless otherwise shown or specified.
   5. Edges of members in contact with concrete or masonry shall have a square corner caulking rebate.
   6. Fabricate members less than 14 feet in length from one piece of lumber, back channeled and molded a shown.
   7. Plastic Laminate Work:
      a. Factory glued to a plywood 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. Use plastic molded edge strips on 3/4-inch molded thick or thinner core material.

c. Provide plastic backing sheet on underside of countertops, vanity tops, through-wall counter and sills including backsplashes and endsplashes of countertops.

d. Use backing sheet on concealed large panel surface when decorative face does not occur.

B. Benches:

1. Fabricate from 2-inch stock strips of plain-sawed White Oak, or Maple. Use preservative-treated softwood.
2. Solid seats securely glued together of spliced, doweled, or double tongued and grooved wood pieces. Where open joints are indicated, work each wood piece from solid stock.
3. Round top edges and corners where exposed.

C. Mounting Strips, Shelves and Rods:

1. Cut mounting strips from 1- by 4-inch softwood stock, with exposed edge slightly rounded.
2. Cut wood shelf from softwood 1-inch stock, of width shown, exposed edge slightly rounded. Option: Use 3/4-inch-thick plywood with 3/4-inch softwood edge nosing on exposed edge, slightly rounded.
3. Plastic laminate covered, 3/4-inch-thick plywood core with edges and ends having plastic molded edge strips. Size, finish and number as shown.

D. Countertops or Work Tops:

1. Fabrication with plastic laminate over 1-1/4-inch-thick core unless shown otherwise.

a. Use decorative laminate for exposed edges of tops 1-1/2-inch-wide and on backsplash and endsplash. Use plastic or metal edges for top edges less than 1-1/2 inches wide.

b. Countertops shall have a bullnose front edge as shown on the Drawings.

c. Assemble backsplash and endsplash to countertop.

d. Use one-piece counters for straight runs.

e. Miter corners for field joints with overlapping blocking on underside of joint.

2. Fabricate wood counter for workbenches as shown.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

A. Maintain work areas and storage areas to a minimum temperature of 70 degrees 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, masonry, or plaster work are not complete and dry.

3.2 INSTALLATION

A. General:

1. Millwork receiving transparent finish shall be primed and back-painted on concealed surfaces. Set no millwork until primed and back-painted.
2. Secure trim with fine finishing nails, screws, or glue as required.
3. Set nails for putty stopping. Use washers under bolt heads where no other bearing plate occurs.
4. Seal cut edges of preservative and fire-retardant treated wood materials with a certified acceptable sealer.
5. Coordinate with plumbing and electrical work for installation of fixtures and service connections in millwork items.
6. Plumb and level items unless shown otherwise.
7. Nail finish at each blocking, lookout, or other nailer and intermediate points; toggle or expansion bolt in place where nails are not suitable.

B. Benches:

1. Use stainless-steel countersunk screws to secure wood seats to brackets, angle, or pipe supports.
2. Freestanding Benches: Support within 8 inches of ends and not over 3 feet on centers with pipe bench supports.

C. Shelves:

1. Install mounting strip at back wall and end wall for shelves in closets where shown secured with toggle bolts at each end and not over 24-inch centers between ends.
   a. Nail Shelf to mounting strip at ends and to back wall strip at not over 36 inches on center.
   b. Install metal bracket, ANSI A156.16, B04041, not over 4-foot centers when shelves exceed 6 feet in length.
   c. Install metal bracket, ANSI A156.16, B04051, not over 4 feet on centers where shelf length exceeds 6 feet in length with metal

rods, clothes hanger bars ANSI A156.16, L03131, of required length, full length of shelf.

2. Install vertical slotted shelf standards, ANSI A156.9, B04103 to studs with toggle bolts through each fastener opening. Double-slotted shelf standards may be used where adjacent shelves terminate.
   a. Install brackets ANSI A156.9, B04113, providing supports for shelf not over 36 inches on center and within 1/2-inch of shelf end unless shown otherwise.
   b. Install shelves on brackets so front edge is restrained by bracket.

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SECTION 06 61 16
SOLID POLYMER (SOLID SURFACING) FABRICATIONS

PART 1 - GENERAL

1.1 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to within the text by the basic designation only.

B. ASTM International (ASTM):
ASTM D2583.....(2013) Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D5116.....(2010) Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products
ASTM D570.....(1998; E 2010; R 2010) Standard Test Method for Water Absorption of Plastics
ASTM D638.....(2010) Standard Test Method for Tensile Properties of Plastics
ASTM D696.....(2008; E 2013) Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C With a Vitreous Silica Dilatometer
ASTM E84.....(2013a) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G21.....(2009) Determining Resistance of Synthetic Polymeric Materials to Fungi

C. International Association Of Plumbing And Mechanical Officials (IAPMO):
IAPMO Z124.3.....(2005) Plastic Lavatories
IAPMO Z124.6.....(2007) Plastic Sinks

D. National Electrical Manufacturers Association (NEMA):
ANSI/NEMA LD 3.....(2005) Standard for High-Pressure Decorative Laminates

E. NSF International (NSF):
NSF/ANSI 51.....(2012) Food Equipment Materials

F. Scientific Certification Systems (SCS):
SCS.....Scientific Certification Systems (SCS)Indoor Advantage

G. Tile Council Of North America (TCNA):
TCNA Hdbk.....(2013) Handbook for Ceramic, Glass, and Stone Tile Installation

H. U.S. Green Building Council (USGBC):
LEED NC.....(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

I. UL Environment (ULE):
ULE Greenguard.....UL Greenguard Certification Program

1.2 SYSTEM DESCRIPTION

A. Work under this Section includes counter and transaction top and other items utilizing solid polymer (solid surfacing) fabrication as shown on

the Drawings and as described in this Specification. Do not change source of supply for materials after work has started, if the appearance of finished work would be affected.

B. In most instances, installation of solid polymer fabricated components and assemblies will require strong, correctly located structural support provided by other trades. To provide a stable, sound, secure installation, close coordination is required between the solid polymer fabricator/installer and other trades to ensure that necessary structural wall support, cabinet countertop structural support, proper clearances, and other supporting components are provided for the installation of wall panels, countertops, shelving, and all other solid polymer fabrications to the degree and extent recommended by the solid polymer manufacturer.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
   1. Shop Drawings: Show design and installation details.
   2. Manufacturer’s Literature and Product Data:
      a. Solid polymer material
      b. Qualifications
      c. Certification
   3. Samples: Submit a 4- by 4-inch sample of each indicated product.
   4. Test Reports: Solid polymer material.
   5. Operation and Maintenance Data: Cleanup.

1.4 QUALITY ASSURANCE

A. Qualifications: To ensure warranty coverage, solid polymer fabricators shall be certified to fabricate by the solid polymer material manufacturer being utilized. Mark all fabrications with the fabricator's certification label affixed in an inconspicuous location. Fabricators shall have a minimum of 5 years of experience working with solid polymer materials. Submit solid polymer manufacturer's certification attesting to fabricator qualification approval.

B. Mock-ups: Submit Detail Drawings indicating locations, dimensions, component sizes, fabrication and joint details, attachment provisions, installation details, and coordination requirements with adjacent work. Prior to final approval of shop drawings, provide a full-size mock-up of a typical countertop. The mock-up shall include all solid polymer components required to provide a completed unit. The mock-up shall utilize finishes in patterns and colors indicated on the Drawings. Should the mock-up not be approved, rework or remake it until approval is secured.Remove rejected units from the jobsite.Approved mock-up may remain as part of the finished work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver materials to Project site until areas are ready for installation. Deliver components and materials to the site undamaged, in containers clearly marked and labeled with manufacturer's name. Materials shall be stored indoors and adequate precautions taken to prevent damage to finished surfaces. Provide protective coverings to

prevent physical damage or staining following installation, for duration of Project.

1.6 WARRANTY

A. Provide manufacturer's warranty of 10 years against defects in materials, excluding damages caused by physical or chemical abuse or excessive heat. Warranty shall provide for material and labor for replacement or repair of defective material for a period of 10 years after component installation.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Provide solid polymer material that is a homogeneous filled solid polymer; not coated, laminated or of a composite construction; meeting IAPMO Z124.3 and IAPMO Z124.6 requirements. Material shall have minimum physical and performance properties specified. Superficial damage to a depth of 0.01-inch shall be repairable by sanding or polishing. Material thickness shall be as indicated on the Drawings. In no case shall material be less than ¼-inch in thickness. Submit a minimum 4- by 4-inch sample of each color and pattern for approval. Samples shall indicate full range of color and pattern variation. Approved samples shall be retained as a standard for this work. Submit test report results from an independent testing laboratory attesting that the submitted solid polymer material meets or exceeds each of the specified performance requirements.

B. Cast, 100 Percent Acrylic Polymer Solid Surfacing Material: Cast, 100 percent acrylic solid polymer material shall be composed of acrylic polymer, mineral fillers, and pigments and shall meet the following minimum performance requirements:

PROPERTY	REQUIREMENT (min. or max.)	TEST PROCEDURE
Tensile Strength	4,000 psi (max.)	ASTM D638
Hardness	55-Barcol Impressor (min.)	ASTM D2583
Thermal Expansion	0.000023-in/in/F (max.)	ASTM D696
Boiling Water Surface Resistance	No Change	ANSI/NEMA LD 3-3.05
High Temperature Resistance	No Change	ANSI/NEMA LD 3-3.06
Impact Resistance (Ball drop)		ANSI/NEMA LD 3-303
¼-inch sheet	36 inches, ½-lb ball, no failure	
½-inch sheet	140 inches, ½-lb ball, no failure	
¾-inch sheet	200 inches, ½-lb ball, no failure	
Mold & Mildew Growth	No growth	ASTM G21
Bacteria Growth	No growth	ASTM G21
Liquid Absorption (Weight in 24 hrs.)	0.1 percent max.	ASTM D570

PROPERTY	REQUIREMENT (min. or max.)	TEST PROCEDURE
Flammability		ASTM E84
Flame Spread	25 max.	
Smoke Developed	30 max.	
Sanitation	"Food Contact" approval	NSF/ANSI 51

C. Material Patterns and Colors: Patterns and colors for all solid polymer components and fabrications shall be those indicated on the Project Drawings. Pattern and color shall occur, and shall be consistent in appearance, throughout the entire depth (thickness) of the solid polymer material.

D. Surface Finish: Exposed finished surfaces and edges shall receive a uniform appearance. Exposed surface finish shall be as indicated on the Drawings.

2.2 ACCESSORY PRODUCTS

A. Accessory products, as specified below, shall be manufactured by the solid polymer manufacturer or shall be products approved by the solid polymer manufacturer for use with the solid polymer materials being specified.

B. Seam Adhesive: Seam adhesive shall be a 2-part adhesive kit to create permanent, inconspicuous, non-porous, hard seams and joints by chemical bond between solid polymer materials and components to create a monolithic appearance of the fabrication. Adhesive shall be approved by the solid polymer manufacturer. Adhesive shall be color-matched to the surfaces being bonded where solid-colored, solid polymer materials are being bonded together. The seam adhesive shall be clear or color matched where particulate patterned, solid polymer materials are being bonded together.

C. Panel Adhesive: Panel adhesive shall be neoprene-based panel adhesive meeting TCNA Hdbk, Underwriter's Laboratories (UL) listed. Use this adhesive to bond solid polymer components to adjacent and underlying substrates.

D. Silicone Sealant: Sealant shall be a mildew-resistant, FDA and OSHA Nationally Recognized Testing Laboratory (NRTL) listed silicone sealant or caulk in a clear formulation. The silicone sealant shall be approved for use by the solid polymer manufacturer. Use sealant to seal all expansion joints between solid polymer components and all joints between solid polymer components and other adjacent surfaces such as walls, floors, ceiling, and plumbing fixtures.

2.3 FABRICATIONS

A. Components shall be factory or shop fabricated to sizes and shapes indicated, to the greatest extent practical, in accordance with approved Shop Drawings and manufacturer's requirements. Provide factory cutouts where indicated on the Drawings. Contours and radii shall be routed to template, with edges smooth. Defective and inaccurate work will be rejected. Submit product data indicating product description, fabrication information, and compliance with

specified performance requirements for solid polymer, joint adhesive, and sealants.

B. Joints and Seams: Form joints and seams between solid polymer components using manufacturer's approved seam adhesive. Joints shall be inconspicuous in appearance and without voids to create a monolithic appearance.

C. Edge Finishing: Rout and finish component edges to a smooth, uniform appearance and finish. Edge shapes and treatments, including any inserts, shall be a bullnose as detailed on the Drawings. Rout all cutouts, then sand all edges smooth. Repair or reject defective or inaccurate work.

D. Countertops: Fabricate all solid surfacing, solid polymer countertop components from ½-inch-thick material. Edge details, dimensions, locations, and quantities shall be as indicated on the Drawings. Attach 2-inch-wide reinforcing strip of polymer material under each horizontal countertop seam. Submit a minimum 1-foot-wide by 6-inch-deep, full-size sample for each type of countertop shown on the Project Drawings. The sample shall include the edge profile as detailed on the Project Drawings. Solid polymer material shall be of a pattern and color as indicated on the Drawings. Sample shall include at least 1 seam. Approved sample shall be retained as standard for this work.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Components: Install all components and fabricated units plumb, level, and rigid. Make field joints between solid polymer components using solid polymer manufacturer's approved seam adhesives, to provide a monolithic appearance with joints inconspicuous in the finished work.

B. Silicone Sealant: Use a clear, silicone sealant or caulk to seal all expansion joints between solid polymer components and all joints between solid polymer components and other adjacent surfaces such as walls, floors and ceiling. Sealant bead shall be smooth and uniform in appearance and shall be the minimum size necessary to bridge any gaps between the solid surfacing material and the adjacent surface. Bead shall be continuous and run the entire length of the joint being sealed.

3.2 CLEANUP

A. Components shall be cleaned after installation and covered to protect against damage during completion of the remaining Project items. Components damaged after installation by other trades will be repaired or replaced at the General Contractor's cost. Component supplier will provide a repair/replace cost estimate to the General Contractor who shall approve estimate before repairs are made. Submit a minimum of 6 copies of maintenance data indicating manufacturer's care, repair and cleaning instructions. Maintenance video shall be provided, if available. Maintenance kit for matte finishes shall be submitted.

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SECTION 06 61 60
TRANSLUCENT RESIN PANEL SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the plastic fabrication of translucent resin panels as shown and specified in the described system(s) and related accessories.

1. Front of transaction desk.

B. The extent of solid polymer fabrication is shown on the Drawings.

C. Related Sections include the following: Section 06 20 00 FINISH CARPENTRY.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Project Pre-installation Meeting:

1. Owner, Architect, Contractor, Installer shall meet at Project site within 1 week of scheduled installation.

2. Review mounting conditions, installation and storage instructions, fabrication requirements, seaming and protection measures.

1.3 SUBMITTALS

A. General: Submit the following in accordance with conditions of Contract and Division 1 Specification Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Product List: Minimum of 3 completed installations or 3 installations of similar materials and complexity. Include contact name and email address for each product.

C. Product Data: Submit manufacturer’s product data; include product description, fabrication information, and compliance with specified performance requirements.

D. Submit product test reports from a qualified independent third party testing agency indicating each type and class of panel system complies with the Project performance requirements, based on comprehensive testing of current products. Previously completed test reports will be acceptable if for current manufacturer and indicative of products used on this Project.

1. Test reports required are:

a. Rate of Burning (ASTM D 635).

b. Self-Ignition Temperature (ASTM D 1929).

c. Density of Smoke (ASTM D 2843).

E. Shop Drawings: Include plans, elevations, sections, panel dimensions, details, and attachments to other work.

F. Samples for Initial Selection: Submit minimum 2-inch by 2-inch samples. Indicate full color, texture and pattern variation.

G. Samples for Verification: Submit minimum 4-inch by 4-inch sample for each type, texture, pattern and color of solid translucent resin panel plastic fabrication.

H. Mockups:

1. Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects.
2. Build mockup of each type of plastic fabrication.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

I. Maintenance Data: Submit manufacturer’s care and maintenance data, including care, repair and cleaning instructions. Include in Project closeout documents.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications:

1. Materials and systems shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least 3 consecutive years and which can show evidence of those materials being satisfactorily used on at least 3 projects of similar size, scope and location. At least 1 of the projects shall have been successful for use 1 year or longer.
2. Manufacturer must offer a documented reclamation process that will take back, at the manufacturer’s cost, panels that are at their end of life cycle.
3. Manufacturer must have documented training and qualification program for fabrication and installation of plastic fabrications.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver plastic fabrications, systems and specified items in manufacturer’s standard protective packaging.

B. Do not deliver plastic fabrications, system, components and accessories to Project site until areas are ready for installation.

C. Store materials in a flat orientation in a dry place that is not exposed to exterior elements. Materials are to be protected against damage from moisture and direct sunlight.

D. Store in area of installation minimum of 24 hours prior to installation.

E. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent damage or staining following installation for duration of Project.

F. Before installing plastic fabrications, permit them to reach room temperature.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install solid polymer 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.

1.7 WARRANTY

A. Manufacturer's Special Warranty on Plastic Fabrications: Manufacturer's standard form agreeing to repair or replace units that fail in material or workmanship within the specified warranty period.

B. Warranty Period: 1 year after Substantial Completion Date.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: Basis of Design: 3form, Inc., Salt Lake City, Utah, USA, telephone 801-649-2500.

2.2 MATERIALS

A. 3form Chroma:

1. Engineered acrylic resin
2. Sheet Size: Maximum 4' x 10'.
3. Thickness: Minimum ½-inch.
4. Basis of Design Product: The design of plastic fabrications is based on Chroma as provided by 3form, Inc. Products from other manufacturers must be approved by the Contracting Officer's Representative (COR) prior to bidding in accordance with the Instructions to Bidders.

B. Sheet Minimum Performance Attributes:

1. Rate of Burning (ASTM D 635). Material must attain CC2 Rating for a nominal thickness of 0.060-inch and greater.
2. Self-Ignition Temperature (ASTM D 1929). Material must have a self-ignition temperature greater than 850 degrees F.
3. Density of Smoke (ASTM D 2843). Material must have a smoke density less than 10 percent.
4. Color infusion must use water soluble dyes and penetrate at least 150 microns into material.
5. Applied coatings must be low-VOC, contain non-toxic pigments, not contain any heavy metals and be approved for exterior use.
6. Matte surface should be completely renewable onsite.

2.3 FABRICATION

A. General: Fabricate plastic fabrications to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes, profiles and other characteristics are indicated on the Drawings. Panels shall incorporate rounded, polished edges as shown on Drawings.

B. Comply with manufacturer's written recommendations for fabrication.

C. Machining: Acceptable means of machining are listed below. Ensure that material is not chipped or warped by machining operations.

1. Sawing: Select equipment and blades suitable for type of cut required.
2. Drilling: Drills specifically designed for use with plastic products.

3. Routing.
4. Tapping.

D. Forming: Form products to shapes indicated using the appropriate method listed below. Comply with manufacturer's written instructions.

1. Cold bending.
2. Hot bending.
3. Thermoforming: Acceptable only on uncoated material.
4. Drape forming.
5. Matched mold forming.
6. Mechanical forming.

E. Laminating: Laminate to substrates indicated using adhesives and techniques recommended by manufacturer.

2.4 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.

B. Cleaner: Type recommended by manufacturer.

C. Standoffs/Spacers: Furnish standoffs for panel installation to keep panels clear off transaction desk surface and allow for installation of lighting as shown on the Drawings. Standoffs shall be brushed stainless steel or brushed chrome.

D. Fasteners: Use screws designed specifically for plastics. Provide threaded metal inserts for applications requiring frequent disassembly such as light fixtures.

E. Bonding Cements: May be achieved with solvents or adhesives, suitable for use with product and application.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

A. General: Comply with manufacturer's written instructions for the installation of plastic fabrications. Sizes, profiles and other characteristics are indicated on the Drawings.

B. Panels have a directional pattern to be maintained for the entire installation. Application of panels shall be of a single panel without seams and/or joints. Follow manufacturer's installation instructions and as shown on the Drawings.

C. Manufacturer's shop shall fabricate items to the greatest degree possible.

D. Installation should be performed by an authorized installer.

E. Utilize fasteners, adhesives and bonding agents recommended by manufacturer for type of installation indicated. Material that is chipped, warped, hazed or discolored as a result of installation or fabrication methods will be rejected.

F. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.

G. Panel edges shall be polished.

3.3 CLEANING AND PROTECTION

A. Protect surfaces from damage until date of Substantial Completion. Repair work or replace damaged work, which cannot be repaired to Architect’s satisfaction.

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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

A. Section 09 22 16, NON-STRUCTURAL FRAMING.

B. Section 09 29 00, GYPSUM BOARD.

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, each type used.
2. Adhesive, each type used.
3. Tape.

C. Certificates: Stating the type and thickness of the insulation to be installed.

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):

C270-10.....Mortar for Unit Masonry
C516-08.....Vermiculite Loose Fill Thermal Insulation
C549-06.....Perlite Loose Fill Insulation
C552-07.....Cellular Glass Thermal Insulation
C553-08.....Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications
C578-10.....Rigid, Cellular Polystyrene Thermal Insulation
C591-09.....Unfaced Preformed Rigid Cellular Polyisocynurate Thermal Insulation

C612-10.....Mineral Fiber Block and Board Thermal Insulation
C665-06.....Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing
C728-05 (R2010).....Perlite Thermal Insulation Board
C954-10.....Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Base to Steel Studs From 0.033-inch to 0.112-inch 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
D312-00(R2006).....Asphalt Used in Roofing
E84-10.....Surface Burning Characteristics of Building Materials
F1667-11.....Driven Fasteners: Nails, Spikes and Staples

PART 2 - PRODUCTS

2.1 INSULATION – GENERAL:

A. Where acoustical or sound insulation is specified or shown for insulation, the thickness shown on the Drawings is nominal. Use only insulation with actual thickness that is not less than that required to provide the acoustical resistance specified.

B. Where more than one type of insulation is specified, the type of insulation for each use is optional, except use only one type of insulation in any particular area.

2.2 ACOUSTICAL INSULATION:

A. Mineral Fiber Boards: ASTM C553, Type II, flexible, or Type III, semirigid (4.5-pound nominal density).

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

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

2.3 FASTENERS:

A. Staples or Nails: ASTM F1667, zinc-coated, size and type best suited for purpose.

B. Screws: ASTM C954 or C1002, size and length best suited for purpose with washer not less than 2 inches in diameter.

C. Impaling Pins: Steel pins with head not less than 2 inches in diameter with adhesive for anchorage to substrate. Provide impaling pins of length to extend beyond insulation and retain cap washer when washer is placed on the pin.

2.4 ADHESIVE:

A. As recommended by the manufacturer of the insulation.

B. Asphalt: ASTM D312, Type III or IV.

C. Mortar: ASTM C270, Type 0.

2.5 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 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.

D. Where acoustical insulation is installed above suspended ceilings, install blanket at right angles to the main runners or framing. Extend insulation over wall insulation systems not extending to structure above.

E. Where semirigid insulation is used which is not full thickness of cavity, adhere to one side of cavity maintaining continuity of insulation and covering penetrations or embedments in insulation.

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SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.1 DESCRIPTION

A. Closures of openings in walls, floors, and roof decks against penetration of flame, heat, and smoke or gases in fire-resistant rated construction.

B. 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.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturers literature, data, and installation instructions for types of firestopping and smoke stopping used.

C. List of FM, UL, or WH classification number of systems installed.

D. Certified laboratory test reports for ASTM E814 tests for systems not listed by FM, UL, or WH proposed for use.

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 WARRANTY

A. Firestopping work subject to the terms of the Article “Warranty of Construction,” FAR clause 52.246-21, except extend the warranty period to 5 years.

1.6 QUALITY ASSURANCE

A. FM, UL, or WH or other approved laboratory tested products will be acceptable.

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):

E84-10.....Surface Burning Characteristics of Building Materials

E814-11.....Fire Tests of Through-Penetration Fire Stops

C. Factory Mutual Engineering and Research Corporation (FM):

Annual Issue Approval Guide Building Materials

D. Underwriters Laboratories, Inc. (UL):

Annual Issue Building Materials Directory

Annual Issue Fire Resistance Directory

1479-10.....Fire Tests of Through-Penetration Firestops

E. Warnock Hersey (WH):

Annual Issue Certification Listings

PART 2 - PRODUCTS

2.1 FIRESTOP SYSTEMS

A. Use 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.

B. Through-penetration firestop systems and firestop devices tested in accordance with ASTM E814 or UL 1479 using the "F" or "T" rating to maintain the same rating and integrity as the fire barrier being sealed. "T" ratings are not required for penetrations smaller than or equal to 4-inch-nominal pipe or 16 square inches in overall cross-sectional area.

C. Products requiring heat activation to seal an opening by its intumescence shall exhibit a demonstrated ability to function as designed to maintain the fire barrier.

D. Firestop sealants used for firestopping or smoke sealing shall have following properties:

1. Contain no flammable or toxic solvents.
2. Have 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 used in exposed areas, shall be 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.
   3. Intumescent products which would expand to seal the opening and act as fire, smoke, toxic fumes, and, water sealant.
F. Maximum flame spread of 25 and smoke development of 50 when tested in accordance with ASTM E84.
G. FM, UL, or WH rated or tested by an approved laboratory in accordance with ASTM E814.
H. Materials shall be asbestos free.

2.2 SMOKE STOPPING IN SMOKE PARTITIONS

A. Use silicone sealant in smoke partitions as specified in Section 07 92 00, JOINT SEALANTS.
B. Use mineral fiber filler and bond breaker behind sealant.
C. Sealants shall have a maximum flame spread of 25 and smoke developed of 50 when tested in accordance with E84.
D. 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.

3.2 PREPARATION

A. Remove dirt, grease, oil, 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 6 inches on either side of the fire rated assembly prior to applying the

firestopping materials unless the firestopping materials are tested and approved for use on insulated pipes.

3.3 INSTALLATION

A. Do not begin 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.

C. Install smoke stopping seals in smoke partitions.

3.4 CLEANUP AND ACCEPTANCE OF WORK

A. As work on each floor is completed, remove materials, litter, and debris.

B. Do not move materials and equipment to the next scheduled work area until completed Work is inspected and accepted by the COR.

C. Clean up spills of liquid-type materials.

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SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section covers all sealant and caulking materials and their application, wherever required for complete installation of building materials or systems.

1.2 RELATED WORK

A. Masonry Control and Expansion Joint: Section 04 20 00, UNIT MASONRY.

B. Firestopping Penetrations: Section 07 84 00, FIRESTOPPING.

C. Glazing: Section 08 80 00, GLAZING.

D. Glazed Aluminum Storefront: Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.

E. Sound-Rated Gypsum Partitions/Sound Sealants: Section 09 29 00, GYPSUM BOARD.

F. Mechanical Work: Section 21 05 11, COMMON WORK RESULTS FOR FIRE SUPPRESSION; Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING; Section 23 05 11, COMMON WORK RESULTS FOR HVAC AND STEAM GENERATION.

1.3 QUALITY CONTROL

A. Installer Qualifications: An experienced installer 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.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Volatile Organic Compound (VOC): Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's installation instructions for each product used.

C. Manufacturer's Literature and Data:

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

1.5 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 40 degrees F.

b. When joint substrates are wet.

B. Joint-Width Conditions: 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: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 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 90 degrees F or less than 40 degrees F.

1.7 DEFINITIONS

A. Definitions of terms in accordance with ASTM C717 and as specified.

B. Back-up 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.

1.8 WARRANTY

A. Warranty sealing against leaks, adhesion, and cohesive failure, and subject to terms of "Warranty of Construction," FAR Clause 52.246-21, except that warranty period shall be extended to 2 years.

B. General Warranty: Special warranty specified in this Article shall not deprive Government of other rights Government may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

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 Society for Testing and Materials (ASTM):

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

C612-10.....Mineral Fiber Block and Board Thermal Insulation

C717-10.....Standard Terminology of Building Seals and Sealants

C834-10.....Latex Sealants

C919-08.....Use of Sealants in Acoustical Applications

C920-10.....Elastomeric Joint Sealants

C1021-08.....Laboratories Engaged in Testing of Building Sealants

C1193-09.....Standard Guide for Use of Joint Sealants

C1330-02 (R2007).....Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants

D1056-07.....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

PART 2 - PRODUCTS

2.1 SEALANTS

A. S-1:

1. ASTM C920, polyurethane or polysulfide.
2. Type M.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 20-40.

B. S-2:

1. ASTM C920, polyurethane or polysulfide.
2. Type M.
3. Class 25.

4. Grade P.
5. Shore A hardness of 25-40.

C. S-3:
1. ASTM C920, polyurethane or polysulfide.
2. Type S.
3. Class 25, joint movement range of plus or minus 50 percent.
4. Grade NS.
5. Shore A hardness of 15-25.
6. Minimum elongation of 700 percent.

D. S-4:
1. ASTM C920 polyurethane or polysulfide.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-40.

E. S-5:
1. ASTM C920, polyurethane or polysulfide.
2. Type S.
3. Class 25.
4. Grade P.
5. Shore hardness of 15-45.

F. S-6:
1. ASTM C920, silicone, neutral cure.
2. Type S.
3. Class: Joint movement range of plus 100 percent to minus 50 percent.
4. Grade NS.
5. Shore A hardness of 15-20.
6. Minimum elongation of 1,200 percent.

G. S-7:
1. ASTM C920, silicone, neutral cure.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-30.
6. Structural glazing application.

H. S-8:
1. ASTM C920, silicone, acetoxy cure.

2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-30.
6. Structural glazing application.

I. S-9:
1. ASTM C920 silicone.
2. Type S.
3. Class 25.
4. Grade NS.
5. Shore A hardness of 25-30.
6. Non-yellowing, mildew-resistant.

2.2 CAULKING COMPOUND

A. C-1: ASTM C834, acrylic latex.

B. C-2: One-component acoustical caulking, non-drying, non-hardening, synthetic rubber.

2.3 COLOR

A. Sealants used with exposed masonry shall match color of mortar joints.

B. Sealants used with unpainted concrete shall match color of adjacent concrete.

C. Color of sealants for other locations shall be light gray or aluminum, unless specified otherwise.

D. Caulking shall be light gray or white, unless specified otherwise.

2.4 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, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to 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.

2.5 FILLER

A. Mineral Fiber Board: 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 – NONPOROUS SURFACES

A. Chemical cleaners acceptable to manufacturer of sealants and sealant backing material free of oily residues and other substances capable of staining or harming joint substrates and adjacent nonporous 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.

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 the following:
   a. Concrete.
   b. Masonry.
   c. 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.
   a. Metal.
   b. Glass.
   c. Porcelain enamel.
   d. Glazed surfaces of ceramic tile.

C. Do not cut or damage joint edges.

D. Apply 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.
   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.

F. Take all necessary steps to prevent three-sided adhesion of sealants.

3.3 BACKING INSTALLATION:

A. Install back-up 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 back-up rod and position the rod at proper depth.

C. Cut fillers installed by others to proper depth for installation of back-up rod and sealants.

D. Install back-up rod, without puncturing the material, to a uniform depth, within plus or minus 1/8-inch for sealant depths specified.

E. Where space for back-up rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.

F. Take all necessary steps to prevent three-sided adhesion of sealants.

3.4 SEALANT DEPTHS AND GEOMETRY

A. At widths up to 1/4-inch, sealant depth equal to width.

B. At widths over 1/4-inch, sealant depth 1/2 of width up to 1/2-inch maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.5 INSTALLATION

A. General:

1. Apply sealants and caulking only when ambient temperature is between 40 degrees and 100 degrees F.
2. Do not use 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 use 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 joints to concave surface unless shown or specified otherwise.
8. Finish paving or 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.

B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.

C. Where gypsum board partitions are of sound rated, fire 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 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 1/4-inch bead of sealant around all cut-outs 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.

3.7 CLEANING

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off immediately and rub clean with a solvent as recommended by the caulking or sealant manufacturer.
B. After filling and finishing joints, remove masking tape.
C. Leave adjacent surfaces in a clean and unstained condition.

3.8 LOCATIONS

A. Sanitary Joints:
   1. Walls to Plumbing Fixtures: Type S-9.
   2. Counter Tops to Walls: Type S-9.
   3. Pipe Penetrations: Type S-9.
B. High-Temperature Joints over 400 degrees F:
   1. Exhaust Pipes, Flues, Breech Stacks: Type S-7 or S-8.
C. Interior Caulking:
   1. Typical Narrow Joint 1/4-inch or less at Walls and Adjacent Components: Types C-1 and C-2.
   2. Perimeter of Doors, Windows, Access Panels which Adjoin Concrete or Masonry Surfaces: Types C-1 and C-2.
   3. Joints at Masonry Walls and Columns, Piers, Concrete Walls or Exterior Walls: Types C-1 and C-2.
   4. Perimeter of Lead-Faced Control Windows and Plaster or Gypsum Wallboard Walls: Types C-1 and C-2.
   5. Exposed Isolation Joints at Top of Full-Height Walls: Types C-1 and C-2.
   6. Exposed Acoustical Joint at Sound-Rated Partitions Type C-2.

7. Concealed Acoustic Sealant: Types S-4, C-1 and C-2.

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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. Door Hardware: Section 08 71 00, DOOR HARDWARE.

B. Glazing: Section 08 80 00, GLAZING.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturers Literature and Data:

1. Fire-rated doors and frames, showing conformance with NFPA 80 and Underwriters Laboratory, Inc., or Intertek Testing Services or Factory Mutual fire rating requirements.
2. Sound-rated doors, including test report from Testing Laboratory.

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 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

A1008-10.....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

E90-09.....Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

F. The National Association Architectural Metal Manufactures (NAAMM):

Metal Finishes Manual (AMP 500-06)

G. National Fire Protection Association (NFPA):

80-13.....Fire Doors and Fire Windows

H. Underwriters Laboratories, Inc. (UL):

Fire Resistance Directory

I. Factory Mutual System (FM):

Approval Guide

PART 2 - PRODUCTS

2.1 MATERIALS

A. Sheet Steel: ASTM A1008, cold-rolled for panels (face sheets) of doors.

B. Anchors, Fastenings and Accessories: Fastenings anchors, clips connecting members and sleeves from zinc coated steel.

C. 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. Tolerances as per ANSI A250.8. Thickness, 1-3/4 inches, unless otherwise shown.

2. Close top edge of exterior doors flush and seal to prevent water intrusion.
3. 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. Use for interior locations only. Do not use for stairwell doors, security doors and detention doors.

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, for interior doors, and, Types B, C, E, or F, for exterior doors.

D. Custom Metal Hollow Doors: 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, 0.053-inch-thick sheet steel, types and styles as shown or scheduled.
2. Frames for exterior doors: Fabricate from 0.067-inch-thick galvanized steel conforming to ASTM A525.
3. Frames for labeled fire rated doors.
   a. Comply with NFPA 80. Test by Underwriters Laboratories, Inc. or Factory Mutual.
   b. Fire-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.
4. 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. Stops shall be terminated 6 inches above finished floor, cut at a 45-degree angle, and capped with a steel welded plate of the same gage as the door frame.

D. Glazed Openings:
   a. Integral stop on exterior, corridor, or secure side of door.
   b. Design rabbet width and depth to receive glazing material or panel 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 0.053-inch-thick steel clip angles welded to jamb and drilled to receive two 1/4-inch floor bolts.
      c. Where mullions occur, provide 0.093-inch-thick steel channel anchors, drilled for two 1/4-inch floor bolts and frame anchor screws.
   2. Jamb Anchors:
      a. Locate anchors on jambs near top and bottom of each frame, and at intermediate points not over 24 inches apart, except for fire-rated frames space anchors as required by labeling authority.
      b. Form jamb anchors of not less than 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 Openings:
         1) Steel pipe spacers with 1/4-inch inside diameter welded to plate reinforcing at jamb stops or hat shaped formed strap spacers, 2 inches wide, welded to jamb near stop.
         2) Drill jamb stop and strap spacers for 1/4-inch flat head bolts to pass through frame and spacers.
      e. Modify frame anchors to fit special frame and wall construction and provide special anchors where shown or required.

2.4 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 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 2 fasteners through anchor tabs. Use steel drill screws to steel studs.
2. Frames set in prepared openings of masonry or concrete: Expansion bolt to wall with 1/4-inch expansion bolts through spacers. Where subframes or rough bucks are used, 1/4-inch expansion bolts on 24-inch centers or power-activated drive pins 24 inches on centers.

D. Install anchors for labeled fire-rated doors to provide rating as required.

3.2 INSTALLATION OF DOORS AND APPLICATION OF HARDWARE

A. Install doors and hardware as specified herein and in Section 08 14 00, 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 with plastic-laminate faces.

B. Section includes fire-rated doors, sound-retardant doors, and smoke doors.

1.2 RELATED WORK

A. Metal Door Frames: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.

B. Doors and frames of a forced entry/ballistic resistant rated: Section 08 34 53, SECURITY DOORS AND FRAMES.

C. Door Hardware Including Hardware Location (Height): Section 08 71 00, DOOR HARDWARE.

D. Installation of Doors and Hardware: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES, Section 08 14 00, WOOD DOORS, or Section 08 71 00, DOOR HARDWARE.

E. Glazing: Section 08 80 00, GLAZING.

F. Finish: Section 09 06 00, SCHEDULE FOR FINISHES.

G. Card Readers and Biometric Devices: Section 28 13 00, ACCESS CONTROL.

H. Intrusion Alarm: Section 28 16 11, INTRUSION DETECTION SYSTEM.

I. Security Monitors: Section 28 51 00, SECURITY CONTROL CENTER.

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 plastic-laminate face door 12-inches square, showing details of construction, labeled to show grade and type number and conformance to specified standard.
2. Plastic-laminate sample 8 inches by 11 inches by 1/4-inch showing specified color and finish.

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 fire-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. For interior doors, 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, Jobsite Information.
C. Label package for door opening where used.

1.6 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. Window and Door Manufacturers Association (WDMA):
   I.S.1A-11.....Architectural Wood Flush Doors
   I.S.4-09.....Water-Repellent Preservative Non-Pressure Treatment for Millwork
   I.S.6A-11.....Architectural Wood Stile and Rail Doors
   T.M.6-08.....Adhesive (Glue Bond) Durability Test Method
   T.M.7-08.....Cycle-Slam Test Method
   T.M.8-08.....Hinge-Loading Test Method
   T.M.10-08.....Screw-Holding Test Method

C. National Fire Protection Association (NFPA):

80-10.....Protection of Buildings from Exterior Fire

252-08.....Fire Tests of Door Assemblies

D. ASTM International (ASTM):

E90-09.....Laboratory Measurements of Airborne Sound Transmission Loss

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: 1-3/4 inches unless otherwise shown or specified.

B. Plastic-Laminate-Faced Doors:

1. Interior Solid-Core Doors (SC):
   a. Grade: Custom.
   b. Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD3, Grade HGS.
   c. Color, Patterns, and Finishes: As indicated on the Drawings.
   d. Exposed Vertical Edges: Plastic laminate that matches faces, applied before faces.
   e. Core: Particleboard.
   f. Construction: Three plies. Stiles and rails are bonded to core, and then entire unit is abrasive planed before faces are applied. Faces are bonded to core using a hot press.
2. Glazing: 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 5 inches on centers.

C. Stiles and Rails:

1. Option for Wood Stiles and Rails: Composite material having screw withdrawal force greater than minimum performance level value when tested in accordance with WDMA T.M.10.
2. Provide adequate blocking for bottom of doors having mechanically operated door bottom seal meeting or exceeding the performance duty level per T.M.10 for horizontal door edge screw holding.

D. Fire-Rated Wood Doors:
   1. Fire Performance Rating: Furnish doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated on the Drawings.
   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 No. 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 fire-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 5 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 36.
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 4.0 mil thick clear anodized finish.
      2) Concealed or surface-mounted.

2.2 PREFINISH, PREFIT OPTION

A. Flush doors may be factory machined to receive hardware, bevels, undercuts, cutouts, accessories and fitting for frame.

B. Factory fitting to conform to Specification for shop and field fitting, including factory application of sealer to edge and routings.

2.3 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 plastic-laminate face and quality certification.

2.4 SEALING

A. Give top and bottom edge of doors 2 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 fire-rated doors.

B. Clearances between Doors and Frames and Floors:

1. Maximum 1/8-inch clearance at the jambs, heads, and meeting stiles, and a 3/4-inch clearance at bottom, except as otherwise specified.
2. Maximum clearance at bottom of sound rated doors, light-proofed doors, doors to operating rooms, and doors designated to be fitted with mechanical seal: 3/8-inch.

C. Provide cutouts for special details required and specified.

D. Route 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 1/8-inch for each 2 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 fire-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.

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):
D1.3-08.....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.

B. Number of locks and non-continuous hinges as required to maintain alignment of panel with frame. For fire-rated doors, use hinges and locks as required by fire test.

C. Provide anchors or make provisions in frame for anchoring to adjacent construction. Provide size, number and location of anchors on 4 sides to secure access door in opening. Provide anchors as required by fire test.

2.2 ACCESS DOORS, FIRE-RATED

A. Shall meet requirements for "B" label 1-1/2 hours with maximum temperature rise of 250 degrees F.

B. Comply with NFPA 80 and have Underwriters Laboratories Inc., or other nationally recognized laboratory label for Class B opening.

C. Door Panel: Form of 0.0359-inch-thick steel sheet, insulated sandwich-type construction.

D. Frame: Form of 0.0598-inch-thick steel sheet of depth and configuration to suit material and type of construction where installed. Provide frame flange at perimeter where installed in concrete masonry or gypsum board openings.

1. Weld exposed joints in flange and grind smooth.
2. Provide frame flange at perimeter where installed in concrete masonry or gypsum board.

E. Automatic Closing Device: Provide automatic closing device for door.

F. Hinge: Continuous steel hinge with stainless-steel pin.

G. Lock:

1. Self-latching, with provision for fitting flush a standard screw-in type lock cylinder. Lock cylinder specified in Section 08 71 00, DOOR HARDWARE.
2. Provide latch release device operable from inside of door. Mortise case in door.

2.3 ACCESS DOORS, FLUSH PANEL

A. Door Panel:

1. Form of 0.0747-inch-thick steel sheet.
2. Reinforce to maintain flat surface.

B. Frame:
   1. Form of 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. Provide tamper-proof screws (spanner head locks).

2.4 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.

2.5 SIZE

A. Minimum 24-inch-square door unless otherwise shown or required.

PART 3 - EXECUTION

3.1 LOCATION

A. Provide access panels or doors wherever any valves, traps, dampers, cleanouts, and other control items of mechanical, electrical and conveyor work are concealed in wall or partition, or are above ceiling of gypsum board or plaster.
B. Use fire-rated doors in fire-rated partitions and ceilings.
C. 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 ceiling suspension grid or side walls when installed in ceiling.
B. Set frames so that edge of frames without flanges will finish flush with surrounding finish surfaces.
C. 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.

C. Anchors for fire-rated access doors shall meet requirements of applicable fire test.

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 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. Caulking: Section 07 92 00, JOINT SEALANTS.

B. Application of Hardware: Section 08 14 00, WOOD DOORS; Section 08 11 13, HOLLOW METAL DOORS AND FRAMES; Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.

C. Painting: Section 09 91 00, PAINTING.

D. Card Readers: Section 28 13 11, PHYSICAL ACCESS CONTROL SYSTEMS.

E. Electrical: Division 26, ELECTRICAL.

F. Fire Detection: Section 28 31 00, FIRE DETECTION AND ALARM.

1.3 GENERAL

A. All hardware shall comply with Uniform Federal Accessible Standards (UFAS), unless specified otherwise.

B. Provide 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.

5. Floor closers.

1.4 WARRANTY

A. Automatic door operators shall be subject to the terms of FAR Clause 52.246-21, except that the warranty period shall be 2 years in lieu of 1 year for all items except as noted below:
   1. Locks, Latchsets, and Panic 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 titled "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 6 copies of the schedule per Section 01 33 23. Submit 2 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 4 years of submittal of reports for approval.

1.7 DELIVERY AND MARKING

A. Deliver items of hardware to jobsite in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to Contracting Officer’s Representative (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:

1. All cylinders shall be keyed into existing 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. Cylinders shall be 7-pin type. Keying information shall be furnished at a later date by the COR.
2. Keying will be accomplished by the VA's locksmith. Contractor shall remove construction cores at the end of the Project and furnish new Project removable cores, properly labeled for VA use.

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):

F883-04.....Padlocks

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):

A156.1-06.....Butts and Hinges

A156.2-03.....Bored and Pre-assembled Locks and Latches

A156.3-08.....Exit Devices, Coordinators, and Auto Flush Bolts

A156.4-08.....Door Controls (Closers)

A156.5-01.....Auxiliary Locks and Associated Products

A156.6-05.....Architectural Door Trim

A156.8-05.....Door Controls-Overhead Stops and Holders

A156.12-05 .....Interconnected Locks and Latches

A156.13-05.....Mortise Locks and Latches Series 1000

A156.14-07 .....Sliding and Folding Door Hardware

A156.15-06.....Release Devices-Closer Holder, Electromagnetic and Electromechanical

A156.16-08.....Auxiliary Hardware

A156.17-04 .....Self-Closing Hinges and Pivots

A156.18-06.....Materials and Finishes

A156.20-06 .....Strap and Tee Hinges, and Hasps

A156.21-09.....Thresholds

A156.22-05.....Door Gasketing and Edge Seal Systems

A156.23-04.....Electromagnetic Locks

A156.24-03.....Delayed Egress Locking Systems

A156.25-07 .....Electrified Locking Devices

A156.26-06.....Continuous Hinges

A156.28-07 .....Master Keying Systems

A156.29-07 .....Exit Locks and Alarms

A156.30-03 .....High Security Cylinders

A156.31-07 .....Electric Strikes and Frame Mounted Actuators

A250.8-03.....Standard Steel Doors and Frames

D. National Fire Protection Association (NFPA):

80-10.....Fire Doors and Fire Windows

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 3-knuckle hinges, except 5-knuckle where the required hinge type is not available in a 3-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 3 feet wide or less and Type A2111/A5111 for doors over 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 3 feet wide or less and Type A8111/A5111 for doors over 3 feet wide. Hinges for doors exposed to high humidity areas (shower rooms, toilet rooms, kitchens, janitor rooms, etc.) shall be of stainless-steel material.

B. Provide quantity and size of hinges per door leaf as follows:
   1. Doors Up to 4 Feet High: 2 hinges.
   2. Doors 4 Feet to 7 Feet 5 Inches High: 3 hinges minimum.
   3. Doors Greater than 7 Feet 5 Inches High: 4 hinges.
   4. Doors Up to 3 Feet Wide, Standard Weight: 4-1/2-inch by 4-1/2-inch hinges.
   5. Doors Over 3 Feet to 3 Feet 6 Inches Wide, Standard Weight: 5 inches by 4-1/2 inches.
   6. Doors Over 3 Feet 6 Inches to 4 Feet, Heavy Weight: 5 inches by 4-1/2 inches.
   7. Provide heavy-weight hinges where specified.
   8. At doors weighing 150 lbs. or more, furnish 5-inch-high hinges.
C. See Articles "MISCELLANEOUS HARDWARE" and "HARDWARE SETS" for pivots and 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-thick, hinge leaves with minimum overall width of 4 inches; 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 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: Steel.
   3. Base Metal for Hinges for Fire-Rated Assemblies: 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. 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.

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 exposed to the exterior or 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, floor, 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 1½-inch minimum piston diameter.

2.5 FLOOR CLOSERS AND FLOOR PIVOT SETS

A. Comply with ANSI A156.4. Provide stainless-steel floor plates for floor closers and floor pivots, except where metal thresholds occur. Provide cement case for all floor closers. Floor closers specified for fire doors shall comply with Underwriters Laboratories, Inc., requirements for concealed type floor closers for classes of fire doors indicated on Drawings. Hold-open mechanism, where required, shall engage when door is opened 105 degrees, except when door swing is limited by building construction or equipment, the hold-open feature shall engage when door is opened approximately 90 degrees. The hold-open mechanism shall be selectable on/off by turning a screw through the floor plate. Floor closers shall have adjustable hydraulic back-check, adjustable close speed, and adjustable latch speed. Provide closers with delayed action where a hold-open mechanism is not required. Floor closers shall be multi-sized. Single-acting floor closers shall also have built-in dead stop. Where required, provide closers with special cement cases appropriate for shallow deck installation or where concrete joint lines run through the floor blockout. At offset-hung doors installed in deep reveals, provide special closer arm and spindle to allow for installation. Where stone or terrazzo is applied over the floor closer case, provide closer without floor plate and with extended spindle (length as required) and special cover pan (depth as required) to allow closer to be accessed without damaging the material applied over the closer. Pivots for non-labeled doors shall be cast, forged or extruded brass or bronze.

B. Where floor closer appears in hardware set provide the following as applicable.
   1. Double-Acting Floor Closers: Type C06012.
   2. Single-Acting Floor Closer: Type C06021 (center pivoted). (Intermediate pivot is not required.)
   3. Single-Acting Floor Closers: Type C06041 (offset pivoted).

4. Single-Acting Floor Closer for Labeled Fire Doors: Type C06051 (offset pivoted).
5. Single-Acting Floor Closers for Lead-Lined Doors: Type C06071 (offset pivoted).

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 concrete, masonry or quarry tile construction, use lead expansion shields for mounting door stops.

C. Where cylindrical locks with turn pieces or pushbuttons occur, equip wall bumpers Type L02251 (rubber pads having concave face) to receive turn piece or button.

D. Provide floor stops (Type L02141 or L02161 in office areas; Type L02121 x 3 screws into floor elsewhere). Wall bumpers, where used, must be installed to impact the trim or the door within the leading half of its width. Floor stops, where used, must be installed within 4 inches of the wall face and impact the door within the leading half of its width.

E. Where drywall partitions occur, use floor stops, Type L02141 or L02161 in office areas, Type L02121 elsewhere.

F. Provide stop Type L02011, as applicable for exterior doors. At outswing doors where stop can be installed in concrete, provide stop mated to concrete anchor set in 3-inch core-drilled hole and filled with quick-setting cement.

G. Omit stops where floor mounted door holders are required and where automatic operated doors occur.

H. Provide appropriate roller bumper for each set of doors (except where closet doors occur) where 2 doors would interfere with each other in swinging.

I. Provide appropriate door-mounted stop on doors in individual toilets where floor- or wall-mounted stops cannot be used.

J. Provide door stops on doors where combination closer magnetic holders are specified, except where wall stops cannot be used or where floor stops cannot be installed within 4 inches of the wall.

K. Where the specified wall or floor 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 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

A. Conform to ANSI Standard A156.16. Provide extension strikes for Types L01301 and L01311 holders where necessary.

2.9 LOCKS AND LATCHES

A. Basis of Design: Provide locks and latches by Yale Locks & Hardware, 225 Episcopal Road, Berlin, CT 06037-4004, telephone 800-438-1951, fax 800-338-0965, www.yalelocks.com.
   1. 8800 Series, Grade 1, mortise locks.
   2. Cylindrical locksets, Grade 1, of series as applicable to indicated door functions per Door Hardware Schedule.
   3. Hardware Trim: Carmel – CRR.

B. Conform to ANSI A156.2. Locks and latches for doors 1-3/4 inches thick or over shall have beveled fronts. Lock cylinders shall have not less than 7 pins. Cylinders for all locksets shall be removable core type. Cylinders shall be furnished with construction removable cores and construction master keys. 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, cylindrical 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 ¾-inch throw, unless shorter throw allowed by the door manufacturer’s fire label. Provide temporary keying device or construction core of allow opening and closing during construction and prior to the installation of final cores.

C. 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 Yale Series 8800, Grade 1. All locksets and latchsets shall have lever handles fabricated from cast stainless

steel. Provide sectional (lever x rose) lever design matching. No substitute lever material shall be accepted. All locks and latchsets shall be furnished with 4-7/8-inch curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 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. Cylindrical Lock and Latch Sets: Levers shall meet Americans with Disabilities Act (ADA) requirements. Cylindrical locksets shall be Series 4000 Grade I. All locks and latchsets shall be furnished with 4-7/8-inch curved lip strike and wrought box. At outswing pairs with overlapping astragals, provide flat lip strip with 7/8-inch lip-to-center dimension. Provide lever design to match design selected by Architect or to match existing lever design. Where 2 turn pieces are specified for Lock F76, turn piece on inside knob shall lock and unlock inside knob, and turn piece on outside knob shall unlock outside knob when inside knob is in the locked position. (This function is intended to allow emergency entry into these rooms without an emergency key or any special tool.)
3. Auxiliary locks shall be as specified under hardware sets and conform to ANSI A156.5.
4. Privacy locks in non-mental-health patient rooms shall have an inside thumbturn for privacy and an outside thumbturn for emergency entrance. Single-occupancy patient privacy doors shall typically swing out; where such doors cannot swing out, provide center-pivoted doors with rescue hardware (see HW-2B).

2.10 PUSH-BUTTON COMBINATION LOCKS

A. ANSI/BHMA A156.13, Grade 1. Battery operated pushbutton entry.

B. Construction: Heavy-duty mortise lock housing conforming to ANSI/BHMA A156.13, Grade 1. Lever handles and operating components in compliance with the UFAS and the ADA Accessibility Guidelines. Match lever handles of locks and latchsets on adjacent doors.

C. Special Features: Key override to permit a master keyed security system and a pushbutton security code activated passage feature to allow access without using the entry code.

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 exterior or full interior, as required by application indicated.
2. Strength Ranking: 1,000 lbf.
3. Inductive Kickback Peak Voltage: Not more than 53V.
4. Residual Magnetism: Not more than 4 lbf 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 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 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:

Locks/Keys	**Quantity**
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

A. ANSI Standard A156.5. Provide key cabinet made of cold-rolled, 0.0478-inch-thick furniture steel electro-welded. Doors shall have "no sag" continuous brass-pin piano-type hinge and be equipped with chrome-plated locking door handles, hook cam and mechanical push-button door lock. Key Cabinet and Key Control System shall accommodate all keys for this Project plus 25 percent. Provide minimum number of multiple cabinets where a single cabinet of largest size will not accommodate the required number of keys.

B. Key tags shall consist of 2 sets: Permanent self-locking and loan key snaphook type with tag colors as follows: Red fiber marker of the permanent self-locking type approximately 1-1/4 inches in diameter engraved with the legend "FILE KEY MUST NOT BE LOANED." Also furnish for each hook a white cloverleaf key marker with snap-hooks engraved with the legend "LOAN KEY."

C. The manufacturer of the lock cylinders and locks shall attach a key tag to keys of each lock cylinder and shall mark thereon the respective item number and key change number. Provide each group of keys in a key gathering envelope (supplied by Key Cabinet Manufacturer) in which the lock manufacturer shall include the following information: Item number, key change number and door number. The Contractor shall furnish the Key Cabinet Manufacturer the hardware and keying schedules and change keys.

D. The Key Cabinet Manufacturer shall set up a 3-way cross index system, including master keys, listing the keys alphabetically, the hooks numerically and the key changes numerically on different colored index cards. Index cards shall be typewritten and inserted in a durable binder. Attach the keys to the 2 sets of numbered tags supplied with the cabinet. (The permanent tag and the loan key tag.) Instruct the Owner in proper use of the system. Install cabinet as directed by the COR.

2.15 ARMOR PLATES, KICK PLATES, MOP PLATES AND DOOR EDGING

A. Conform to ANSI Standard A156.6.

B. Provide protective plates and door edging as specified below:

1. Kick plates, mop plates and armor plates of metal, Type J100 series.
2. Provide kick plates and mop plates where specified. Kick plates shall be 10 inches or 12 inches high. Mop plates shall be 6 inches

high. Both kick and mop plates shall be minimum 0.050-inch 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 1-1/2 inches less than width of door, except pairs of metal doors which shall have plates 1 inch less than width of each door. Extend all other kick and mop plates to within ¼-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. Armor plate side of doors;
   b. Exterior side of exterior doors;
   c. Closet side of closet doors;
   d. Both sides of aluminum entrance doors.
4. Armor plates for doors are listed under Article "Hardware Sets." Armor plates shall be thickness as noted in the hardware set, 35 inches high and 1-1/2 inches less than width of doors, except on pairs of metal doors. Provide armor plates beveled on all 4 edges (B4E). Plates on pairs of metal doors shall be 1 inch less than width of each door. Where top of intermediate rail of door is less than 35 inches from door bottom, extend armor plates to within ½-inch of top of intermediate rail. On doors equipped with panic devices, extend armor plates to within ½-inch of panic bolt push bar.
5. Where louver or grille occurs in lower portion of doors, substitute stretcher plate and kick plate in place of armor plate. Size of stretcher plate and kick plate shall be 10 inches high.
6. Provide stainless-steel edge guards where so specified at wood doors. Provide mortised type instead of surface type except where door construction and/or ratings will not allow. Provide edge guards of bevel and thickness to match wood door. Provide edge guards with factory cut-outs for door hardware that must be installed through or extend through the edge guard. Provide full-height edge guards except where door rating does not allow; in such cases, provide edge guards to height of bottom of typical lockset armor front. Forward edge guards to wood door manufacturer for factory installation on 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. Do not provide surface vertical rod panics at exterior doors.

C. Concealed vertical rod panics shall be provided less bottom rod at interior doors, unless lockable or otherwise specified; provide fire pins as required by exit device and door fire labels. Where concealed vertical rod panics are specified at exterior doors, provide with both top and bottom rods.

D. Where removable mullions are specified at pairs with rim panic devices, provide mullion with key-removable feature.

E. At non-rated openings with panic hardware, provide panic hardware with key cylinder dogging feature.

F. 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 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 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 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

A. Conform to ANSI A156.6. Pull Type J401, 6 inches high by ¾-inch diameter with plate Type J302, 3-1/2 inches by 14 inches, unless otherwise specified. Provide pull with projection of 2-3/4 inches and a clearance of 2 inches. Cut plates of door pull plate for cylinders, or turn pieces where required.

2.20 PUSH PLATES

A. Conform to ANSI A156.6. Metal, Type J302, 8 inches wide by 14 inches high. Provide metal Type J302 plates 4 inches wide by 14 inches high where push plates are specified for doors with stiles less than 8 inches wide. Cut plates for cylinders, and turn pieces where required.

2.21 COMBINATION PUSH AND PULL PLATES

A. Conform to ANSI 156.6. Type J303, stainless steel 1/8-inch thick, 3-1/3 inches wide by 16 inches high, top and bottom edges shall be rounded. Secure plates to wood doors with 1-1/2-inch-long No. 12 wood screws. Cut plates for turn pieces, and cylinders where required. Pull shall be mounted down.

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 exterior pairs of doors where either door will close independently regardless of the position of the other door. 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, unless coordinators are plated. Provide bar type

coordinators, except where gravity coordinators are required at acoustic pairs. 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 panic strikes.

2.23 THRESHOLDS

A. Conform to ANSI A156.21, mill finish extruded aluminum, except as otherwise specified. In existing construction, thresholds shall be installed in a bed of sealant with ¼-20 stainless-steel machine screws and expansion shields. In new construction, embed aluminum anchors coated with epoxy in concrete to secure thresholds. Furnish thresholds for the full width of the openings.

B. For thresholds at elevator entrances, see other Sections of Specifications.

C. At exterior doors and any interior doors exposed to moisture, provide threshold with non-slip abrasive finish.

D. Provide with miter returns where threshold extends more than 0.5inch from fame face.

2.24 AUTOMATIC DOOR BOTTOM SEAL AND RUBBER GASKET FOR LIGHT-PROOF OR SOUND-CONTROL DOORS

A. Conform to ANSI A156.22. Provide mortise or under-door type, except where not practical. For mortise automatic door bottoms, provide type specific for door construction (wood or metal).

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.

2.26 MISCELLANEOUS HARDWARE

A. Access Doors Including Sheet Metal, Screen and Woven Wire Mesh Types: Except for fire-rated doors and doors to Temperature Control Cabinets, equip each single or double metal access door with Lock Type E76213, conforming to ANSI A156.5. Key locks as directed. Ship lock prepaid to the door manufacturer. Hinges shall be provided by door manufacturer.

B. Cylinders for Various Partitions and Doors: Key cylinders same as entrance doors of area in which partitions and door occur, except as otherwise specified. Provide cylinders to operate locking devices where specified for following partitions and doors:

1. Folding doors and partitions.
2. Slide-up doors.
3. Swing-up doors.

4. Fire-rated access doors-Engineer's key set.
5. Doors from corridor to electromagnetic shielded room.
6. Day gate on vault door.

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 or wood door frame, except at fire-rated frames, lead-lined frames and frames for sound-resistant, lightproof and electromagnetically shielded doors. Furnish 3 mutes for single doors and 2 mutes for each pair of doors, except double-acting doors. Provide 4 mutes or silencers for frames for each Dutch-type door. Provide 2 mutes for each edge of sliding door which would contact door frame.

2.27 PADLOCKS FOR VARIOUS DOORS, GATES AND HATCHES

A. ASTM E883, size 2-inch-wide chain; furnish extended shackles as required by job conditions. Provide padlocks, with key cylinders, for each door in following areas as noted.

B. Key padlocks as follows:
1. Constant Temperature and Cold Rooms in Research Departments: Research Laboratory Set.
2. Refrigerators in Canteen Department: Canteen Storage Set.
3. All Refrigerator Rooms in Main Kitchen Department: Kitchen Storage Set.
4. Roof Access and Scuttles: Engineer's set.

C. Omit padlocks on communicating refrigerator doors.

2.28 THERMOSTATIC TEMPERATURE CONTROL VALVE CABINETS

A. Where lock is shown, equip each cabinet door (metal) with lock Type E06213, conforming to ANSI A156.5. Key locks in Key Sets approved by COR. See Mechanical Drawings and Specifications for location of cabinets.

B. Cabinet manufacturer shall supply the hinges, bolts and pulls. Ship locks to cabinet manufacturer for installation.

2.29 HINGED WIRE GUARDS (FOR WINDOWS, DOORS AND TRANSOMS) AND WIRE PARTITION DOORS

A. Butt hinges, Type A8133 (special swaging) 4 inches by 3-1/2 inches, Finish US2C.
1. 3 hinges for guards over 3-1/2 feet high.
2. 2 hinges for guards less than 3-1/2 feet high.

B. Conform to ANSI A156.5. Lock Type E06081 for guards and Type E06061 for partitions.
   1. Keying: Except as noted otherwise, key locks like entrance door or space wherein guards and partitions are located except as otherwise specified.
   2. Key locks for partitions enclosing mechanical and electrical equipment in Engineer's Set. (See detailed Drawings for number of locks and butt hinges required for each guard.)

2.30 FINISHES

A. Exposed surfaces of hardware shall have ANSI A156.18, finishes as specified below. Finishes on all hinges, pivots, 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 on exterior and interior of buildings, except where other finishes are specified.

C. Miscellaneous Finishes:
   1. Hinges - Exterior Doors: 626 or 630.
   2. Hinges - Interior Doors: 652 or 630.
   3. Pivots: Match door trim.
   4. Door Closers: Factory applied paint finish. Dull or satin aluminum color.
   5. Thresholds: Mill finish aluminum.
   6. Cover Plates for Floor Hinges and Pivots: 630.
   7. 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. Special Finish: Exposed surfaces of hardware for dark bronze anodized aluminum doors shall have oxidized, oil-rubbed bronze finish (dark bronze). Finish on door closers shall closely match doors.

F. 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 site, verify location of existing hardware, and submit locations to VA COR for approval.

B. For new buildings, locate hardware on doors at heights specified below, with all hand-operated hardware centered within 34 inches to 48 inches, unless otherwise noted:

C. Hardware Heights from Finished Floor:

1. Exit devices centerline of strike (where applicable) 40-5/16 inches.
2. Locksets and latch sets centerline of strike 40-5/16 inches.
3. Deadlocks centerline of strike 48 inches.
4. Hospital arm pull 46 inches to centerline of bottom supporting bracket.
5. Centerline of door pulls to be 40 inches.
6. Push plates and push-pull shall be 50 inches to top of plate.
7. Push-pull latch to be 40-5/16 inches to centerline of strike.
8. Locate other hardware at standard commercial heights. Locate push and pull plates to prevent conflict with other hardware.

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 security bedroom, bathroom and anteroom doors which shall have closer installed parallel arm on exterior side of doors. At exterior doors, closers shall be mounted on interior side. 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**
1-3/4 inches	3 feet and less	4-1/2 inches
1-3/4 inches	Over 3 feet but not more than 4 feet	5 inches
1-3/8 inches (hollow core wood doors)	Not over 4 feet	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 5 feet or less in height	2 butts
Doors over 5 feet high and not over 7 feet 6 inches high	3 butts
Doors over 7 feet 6 inches high	4 butts
Dutch-type doors	4 butts
Doors with spring hinges 4 feet 6 inches high or less	2 butts
Doors with spring hinges over 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 concrete, ceramic or quarry floor tile, or 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 VA COR that upon completion, installer has visited the Project and has accomplished the following:
   1. Readjust 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.

3.5 HARDWARE SETS

A. Following sets of hardware correspond to hardware symbols shown on Drawings. Only those hardware sets that are shown on Drawings will be required. Disregard hardware sets listed in Specifications but not shown on Drawings.

B. Hardware Consultant working on a Project will be responsible for providing additional information regarding these hardware sets. The numbers shown in the following sets come from BHMA standards.

ELECTRIC HARDWARE ABBREVIATIONS LEGEND:

ADO = Automatic Door Operator

EMCH = Electro-Mechanical Closer-Holder

MHO = Magnetic Hold-Open (wall- or floor-mounted)

INTERIOR SINGLE DOORS

HW-1

Each Door to Have:		NON-RATED
1	Continuous Hinge	
1	Door Pull with Plate	J401 x J302
1	Push Plate	J302
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Closer	C02011/C02021
1	Floor Stop	L02121 x 3 FASTENERS
3	Silencers	L03011

HW-1A

Each Door to Have:		RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
		X HOSPITAL TIPS AT INSWING DOORS
1	Latchset	F01
1	Closer	C02011/C02021
		X INSTALL OUTSIDE ROOM
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Floor Stop	L02121 x 3 FASTENERS
1	Threshold	J32300 x 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Seals	R0Y164

HW-1B

Each Door to Have:		NON-RATED/RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X SWING-CLEAR X ADJUSTA-SCREWS
1	Hospital Latch	F01 X PADDLES POINTING DOWN
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Set Seals	R0Y164

NO CLOSER REQUIRED DUE TO EXEMPTION FOR PATIENT ROOM DOORS.

HW-1C

THIS SET NOT USED.

HW-1D

Each Door to Have:		NON-RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X SWING-CLEAR X ADJUSTA-SCREWS
1	Hospital Latch	F01 X PADDLES POINTING DOWN
1	Armor Plate	J101 x 0.050-INCH THICKNESS
1	Mop Plate	J103
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
3	Silencers	L03011

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X SWING-CLEAR X ADJUSTA-SCREWS
1	Hospital Latch	F01 X PADDLES POINTING DOWN
1	Closer	C02011/C02021
1	Armor Plate	J101 x 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Wall Stop (at Inswing Doors)	L02101 CONVEX
1	Set Self-Adhesive Seals	R0Y154

HW-1F

Each Door to Have:		NON-RATED
1	Continuous Hinge	
1	Latchset	F01
1	Kick Plate	J102
1	Wall Stop	L02101 CONVEX
3	Silencers	L03011

HW-1G

Each Door to Have:		NON-RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Latchset	F01
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Wall Stop	L02101 CONVEX
3	Silencers	L03011
1	Coat Hook	L03121

Each Dwarf Door to Have: NON-RATED

1	Gate Spring Pivot Hinge	K13311
1	Door Bolt	L04151
1	Wall Stop	L02101 CONVEX
2	Silencers	L03021

HW-1J

Each [MHO] Door to Have: RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Latchset	F01
1	Closer	C02011/C02021
1	Heavy-Duty Armor Plate	J101 X 0.125-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Magnetic Holder	C00011 TRI-VOLTAGE
1	Set Self-Adhesive Seals	R0Y154

POWER, WIRING, CONDUIT, AND FIRE ALARM CONNECTION BY DIVISION 26.

HW-1K

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Hospital Latch	F01 X PADDLES POINTING DOWN
1	Closer	C02011/C02021
1	Armor Plate	J101 x 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

Each Door to Have: NON-RATED

1	Continuous Hinge	
1	Latchset	F01
1	Kick Plate	J102
1	Wall Stop	L02101 CONVEX
1	Threshold	J32300 x 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-1M

Each Door to Have: NON-RATED

1	Floor Closer	C06011
2	Push Plates	J302
2	Kick Plates	J102
2	Edge Guard (at Wood Doors)	J209M/J212 (VERIFY)
1	Overhead Stop	C01541-ADJUSTABLE

HW-1N

Each Door to Have: NON-RATED

1	Continuous Hinge	
1	Door Pull w/ Plate	J401 x J302
1	Push Plate	J302
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Closer	C02011/C02021
1	Floor Stop	L02121 x 3 FASTENERS
3	Silencers	L03011

Each Lead-Lined Door to Have:		NON-RATED
1	Floor Closer	C6062
2	Push Plates	J302 8″ x 16″
2	Kick Plates	J102
2	Edge Guard (at Wood Doors)	J209M/J212 (VERIFY)
1	Overhead Stop	C01541-ADJUSTABLE

HW-1Q

Each Door to Have:		RATED/NON-RATED
1	Continuous Hinge	
1	Latchset	F01
1	Kick Plate	J102
1	Closer (at rated doors)	C02011/C02021
1	Wall Stop	L02101 CONVEX
1	Threshold	J32300 x 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

Each Door to Have:		RATED/NON-RATED
1 Continuous Hinge		
1 Latchset	F01	
1 Kick Plate	J102	
1 Closer (at rated doors)	C02011/C02021	
1 Wall Stop	L02101 CONVEX	
1 Set Self-Adhesive Seals	R0Y154	

HW-2

Each Door to Have:		RATED/NON-RATED
Hinges	QUANTITY AND TYPE AS REQUIRED	
1 Keyed Privacy Indicator Lock	F13 x OCCUPANCY INDICATOR	
1 Closer	C02011/C02021	
1 Kick Plate	J102	
1 Mop Plate (at Inswing Doors)	J103	
1 Floor Stop	L02121 x 3 FASTENERS	
1 Set Self-Adhesive Seals	R0Y154	

STONE THRESHOLD BY OTHER TRADES.

Each [ADO] Door to Have:		RATED/NON-RATED
1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS x 8-THRUWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Keyed Privacy Indicator Lock	F13 x OCCUPANCY INDICATOR
1	Electric Strike	E09391 (FAIL-SECURE), 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 x 3 FASTENERS
1	Threshold	J32300 x 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

AUTOMATIC DOOR OPERATOR AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

STONE THRESHOLD BY OTHER TRADESS.

HW-2B

Each Door to Have:		NON-RATED
1	Center Pivot Set	C07042
1	Privacy Lock	F02-MOD x THUMBTURN BOTH SIDES X OCCUPANCY INDICATOR
1	Rescue Stop	A1882
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Wall Stop	L02101 CONVEX

STONE THRESHOLD BY OTHER TRADES.

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Privacy Lock	F02-MOD X OCCUPANCY INDICATOR
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Wall Stop	L02101 CONVEX
3	Silencers	L03011

STONE THRESHOLD BY OTHER TRADES.

HW-2D

Each Door to Have: RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Privacy Lock	F02-MOD X OCCUPANCY INDICATOR
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Wall Stop	L02101 CONVEX
1	Set Self-Adhesive Seals	R0Y154

STONE THRESHOLD BY OTHER TRADES.

HW-2E

Each Door to Have: RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Hospital Privacy Latch	F02-MOD X TURNPIECE BOTH SIDES
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Mop Plate (at Inswing Doors)	J103
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Set Self-Adhesive Seals	R0Y154

STONE THRESHOLD BY OTHER TRADES.

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Privacy Lock	F02-MOD X OCCUPANCY INDICATOR
1	Wall Stop	L02101 CONVEX
3	Silencers	L03011
1	Coat Hook	L03121

HW-2G

Each Door to Have: RATED/NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Keyed Privacy Indicator Lock	F13 X OCCUPANCY INDICATOR
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Floor Stop	L02121 X 3 FASTENERS
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

STONE THRESHOLD BY OTHER TRADES.

HW-2H

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Hospital Privacy Latch	F02-MOD X TURNPIECE BOTH SIDES X OCCUPANCY INDICATOR
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
3	Silencers	L03011

STONE THRESHOLD BY OTHER TRADES.

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Privacy Lock	F02-MOD X OCCUPANCY INDICATOR
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Wall Stop	L02101 CONVEX
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

STONE THRESHOLD BY OTHER TRADES.

HW-2K

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Hospital Privacy Latch	F02-MOD X TURNPIECE BOTH SIDES X OCCUPANCY INDICATOR
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

STONE THRESHOLD BY OTHER TRADES.

HW-3

Each Door to Have: RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Office Lock	F04
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 x 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

THIS SET NOT USED.

HW-3B

Each Door to Have: NON-RATED/RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Office Lock	F04
1	Closer	C02011/C02021
1	Floor Stop	L02121 x 3 FASTENERS
1	Door Viewer	L03221 – 190° (VIEW INTO CORRIDOR)
1	Set Self-Adhesive Seals	R0Y154

OMIT VIEWER IF DOOR PROVIDED WITH VISION LITE.

HW-3C

THIS SET NOT USED.

HW-3D

Each Door to Have: RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Office Lock	F04
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 x 3 FASTENERS
1	Threshold	J32300 x 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Office Lock	F04
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154
1	Coat Hook	L03121

OMIT COAT HOOK WHERE GLASS LITE PREVENTS INSTALLATION.

HW-3F

Each Door to Have:		RATED/NON-RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Office Lock	F04
1	Closer	CO2011/CO2021
		AT RATED DOOR
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Office Lock	F04
1	Floor Stop	L02121 x 3 FASTENERS
1	Coat Hook	L03121
1	Door Viewer (Mental Health Only)	L03221 – 190° (VIEW INTO CORRIDOR)
1	Threshold	J32300 x 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

OMIT VIEWER IF DOOR PROVIDED WITH VISION LITE.

OMIT COAT HOOK WHERE GLASS LITE PREVENTS INSTALLATION.

HW-3H

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Office Lock	F04
1	Closer	CO2011/CO2021
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Sets Self-Adhesive Seals	R0Y154

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Office Lock	F04
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Sound/Light Seals	R0Y264/R0Y255

HW-4

Each Door to Have: NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Classroom Lock	F08
1	Overhead Stop	C04541
3	Silencers	L03011

1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THRUWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Classroom Lock	F08
1	Electric Strike	E09311 (FAIL-SECURE), 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103 at TOILET ROOMS ONLY
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

AUTOMATIC DOOR OPERATOR AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

POWER TRANSFER FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

HW-4B

Each Door to Have:		NON-RATED/RATED
1	Continuous Hinge	
1	Public Restroom Lock	F09
1	Closer	C02011/C02021
1	Closer	CO2051/CO2061
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Floor Stop (at Outswing Doors)	L02121 X 3 FASTENERS
1	Wall Stop (at Inswing Doors)	L02101 CONVEX
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

PROVIDE NON-HOLD-OPEN CLOSER AT TOILET ROOMS.

STONE THRESHOLD BY OTHER TRADES.

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Hospital Utility Lock	F09 X PADDLES POINTING DOWN
1	Key Cylinder	TYPE AS REQUIRED
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Seals	R0Y164

HW-4D

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Classroom Lock	F08
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Mop Plate (at Inswing Doors)	J103
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop (at Outswing Doors)	L02121 X 3 FASTENERS
1	Wall Stop (at Inswing Doors)	L02101 CONVEX
1	Set Self-Adhesive Seals	R0Y154

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Utility Lock	F09
1	Closer (at rated doors)	C02011/C02021
1	Closer (at non-rated doors)	CO2051/CO2061
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-4F

Each Door to Have: RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Utility Lock	F09
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop (at Outswing Doors)	L02121 X 3 FASTENERS
1	Wall Stop (at Inswing Doors)	L02101 CONVEX
1	Set Self-Adhesive Seals	R0Y154

HW-4G

Each Door to Have: RATED/NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Utility Lock	F09
1	Closer (at Rated Doors)	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Classroom Lock	F08
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Magnetic Holder	C00011 TRI-VOLTAGE
1	Set Self-Adhesive Seals	R0Y154

POWER, WIRING, CONDUIT, AND FIRE ALARM CONNECTION BY DIVISION 26.

HW-4J

Each Door to Have: RATED/NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Utility Lock	F09
1	Closer (at Rated Doors)	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-4K

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Utility Lock	F09
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Classroom Lock	F08
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Sound/Light Seals	R0Y264/R0Y255

HW-4M

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Classroom Hospital Lock	F08 X PADDLES POINTING DOWN
1	Heavy-Duty Armor Plate	J101 X 0.125-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 x 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-4N

Each Door to Have: RATED/NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Utility Lock	F09
1	Closer (at rated doors)	C02011/C02021
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Classroom Hospital Lock	F08 X PADDLES POINTING DOWN
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-4Q

Each Door to Have: NON-RATED

1	Pivot Set	C07162 X 1,000 LBS WEIGHT CAPACITY
1	Intermediate Pivot	CO7311
1	Utility Hospital Lock	F09 X LEAD-LINED X PADDLES POINTING DOWN
1	Armor Plate	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Set Self-Adhesive Seal	R0Y154

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THRUWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Classroom Lock	F08
1	Electric Strike	E09311 (FAIL-SECURE), 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103 AT TOILET ROOMS ONLY
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

AT TOILET ROOMS, OMIT METAL THRESHOLD; STONE THRESHOLD BY OTHER TRADES.
AUTOMATIC DOOR OPERATOR AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.
POWER TRANSFER FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

HW-4S

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Classroom Lock	F08
1	Heavy-Duty Armor Plate	J101 X 0.125-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Classroom Hospital Lock	F08 X PADDLES POINTING DOWN
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Set Self-Adhesive Seals	R0Y154

HW-4U

Each Door to Have:		NON-RATED/RATED
1	Continuous Hinge	
1	Public Restroom Lock	F09
1	Closer	C02011/C02021
1	Closer	CO2051/CO2061
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Floor Stop (at Outswing Doors)	L02121 X 3 FASTENERS
1	Wall Stop (at Inswing Doors)	L02101 CONVEX
1	Set Self-Adhesive Seals	R0Y154

PROVIDE NON-HOLD-OPEN CLOSER AT TOILET ROOMS.

STONE THRESHOLD BY OTHER TRADES.

1	Pivot Set	C07162 X 1,000 LBS WEIGHT CAPACITY
1	Intermediate Pivot	CO7311
1	Utility Hospital Lock	F09 X LEAD-LINED X PADDLES POINTING DOWN
1	Closer	CO2011/CO2021 X METAL LEAD-LINED COVER
1	Armor Plate	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Holder-Stop	C01541-ADJUSTABLE
1	Set Self-Adhesive Seal	R0Y154

HW-4X

Each [ADO] Lead-Lined Door to Have: NON-RATED

1	Pivot Set	C07162 X 1,000 LBS WEIGHT CAPACITY
1	Intermediate Transfer Pivot	CO7311 X 4 WIRE TRANSFER
1	Utility Hospital Lock	F09 X LEAD-LINED X PADDLES POINTING DOWN
1	Electric Unlatch Strike	E09321
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Armor Plate	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Set Self-Adhesive Seal	R0Y154

POWER TRANSFER PIVOT IS FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

AUTO DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13.

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THRUWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Utility Hospital Lock	F09 X PADDLES POINTING DOWN
1	Electric Unlatch Strike	E09321
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Overhead Stop	C01541-ADJUSTABLE
1	Set Self-Adhesive Seals	R0Y154

POWER TRANSFER PIVOT IS FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

AUTOMATIC DOOR OPERATOR AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

HW-5

Each Door to Have:		RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Storeroom Lock	F07
1	Closer	C02011/C02021
1	Kick Plate	J102 (AT STORAGE, EVM, AND HAC ROOMS ONLY)
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-5A

THIS SET NOT USED.

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Storeroom Lock	F07
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-5C

THIS SET NOT USED.

HW-5D

Each Door to Have: NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Storeroom Lock	F07
1	Kick Plate	J102 (AT STORAGE, EVM, & HAC ROOMS ONLY)
1	Floor Stop (at Inswing Doors)	L02121 X 3 FASTENERS
1	Wall Stop (at Outswing Doors)	L02101 CONVEX
3	Silencers	L03011

HW-5E

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Storeroom Lock	F13-MOD X RIGID OUTSIDE LEVER X KEY RETRACTS DEADBOLT AND LATCHBOLT
1	Armor Plate	J101 X 0.125-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-5F

Each Door to Have:		RATED/NON-RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL
		X ADJUSTA-SCREWS
1	Storeroom Lock	F07
1	Closer (at Rated Doors)	C02011/C02021
1	Heavy-Duty Armor Plate	J101 X 0.125-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-5G

Each Door to Have:		NON-RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Storeroom Lock	F07
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-5H

Each Dutch Door to Have:		NON-RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Dutch Door Bolt	L04161-4″ AT TOP LEAF
1	Storeroom Lock	F07 AT BOTTOM LEAF
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS AT BOTTOM LEAF
1	Wall Stop	L02101 AT BOTTOM LEAF
1	Set Self-Adhesive Seals	R0Y154

HW-5J

Each Door to Have:		RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Storeroom Lock	F07
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-5K

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Storeroom Lock	F07
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-5L

Each Door to Have:		NON-RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Security Storeroom Lock	F13-MOD X RIGID OUTSIDE LEVER X KEY RETRACTS DEADBOLT AND LATCHBOLT
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-6

Each Door to Have:		RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Exit Device	TYPE 1 F13 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Closer	C02011/C02021
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-6A

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
1	Exit Device	TYPE 1 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154/R0Y155

Each [MHO] Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Exit Device	TYPE 1 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Magnetic Holder	C00011 TRI-VOLTAGE
1	Set Self-Adhesive Seals	R0Y154

POWER, WIRING, CONDUIT, AND FIRE ALARM CONNECTION BY DIVISION 26.

HW-6C

Each Door to Have:		NON-RATED/RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Exit Device	TYPE 1 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Closer	C02021
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-6D

Each [ADO] Integrated Door to Have:		RATED
1	Key Cylinder	TYPE AS REQUIRED

ALL HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

AUTO DOOR OPERATOR AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Exit Device	TYPE 1 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Kick Plate	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-6F

Each [ADO] Door to Have: NON-RATED/RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 8-THRUWIRE TRANSFER X IN-HINGE ACCESS PANELS
1	Elec. Exit Device	TYPE 1 F08 LEVER (E04)
1	Key Cylinder	TYPE AS REQUIRED
1	Power Supply	BY EXIT DEVICE MFR. FOR E04 FUNCTION
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

POWER TRANSFER **SHARED BY ELECTRIC PANIC AND** REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

AUTO DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13.

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Exit Device	TYPE 1 F13 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Closer	C02011/C02021
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-7

Each Motorized Roll-up Door to Have: NON-RATED

1 Key Cylinder (for keyswitch) TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 08 33 00, COILING DOORS AND GRILLES

HW-7A

Each Special Door to Have: NON-RATED

1 Padlock TYPE AS REQUIRED PER 08 71 00 2.29.

BALANCE OF HARDWARE BY DOOR MANUFACTURER.

HW-7B

Each RF Shielded Door to Have: NON-RATED

1 Key Cylinder TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 13 49 00.

INTERIOR PAIRS OF DOORS

HW-8

Each [MHO] Pair Integrated Doors to Have: RATED

ALL HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

2	Floor Closers	C06041
2	Intermediate Pivots	C07321
2	Push/Pull Bar Sets	J505 – 12-INCH CENTER-TO-CENTER PULL
2	Overhead Stops	C01541-ADJUSTABLE

HW-8B

Each Pair to Have: NON-RATED

2	Continuous Hinge	
2	Push Plate	J304 8″ X 16″
2	Hospital Grip	J401
2	Kick Plate	J102
2	Mop Plate (at Inswing Doors)	J103
2	Closer	C02011/C02021
2	Floor Stop	L02121 X 3 FASTENERS
2	Silencers	L03011

HW-8C

Each Double-Acting Pair to Have: NON-RATED

2	Double-Acting Floor Closers	C06011
4	Push Plates	J304 8″ X 16″
4	Heavy-Duty Armor Plates	J101 X 0.125-INCH THICKNESS
4	Edge Guard (at Wood Doors)	J209P/J212 (VERIFY)
2	Overhead Holders	C01511-ADJUSTABLE

2	Pivot Sets	C07162
2	Intermediate Transfer Pivots	C07321 X 4-WIRES
2	Intermediate Pivots	C07321
2	Push/Pull Bar Sets	J505 – 12-INCH CENTER-TO-CENTER PULL
2	Overhead Stops	C01541-ADJUSTABLE

AUTO DOOR OPERATORS, CONTROLS, AND REACTIVATION SENSORS BY SECTION 08 71 13.11.

POWER TRANSFERS FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

HW-8E

Each [ADO] Pair to Have:		NON-RATED
2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THRUWIRE TRANSFERS X IN-HINGE ACCESS PANEL
2	Push Plate	J304 8″ X 16″
2	Hospital Grip	J401
2	Kick Plate	J102
2	Mop Plate (at Inswing Doors)	J103
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stop	L02121 X 3 FASTENERS
2	Silencers	L03011

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

POWER TRANSFERS FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THRUWIRE TRANSFERS X IN-HINGE ACCESS PANEL
2	Push Plate	J304 8″ X 16″
2	Hospital Grip	J401
2	Kick Plate	J102
2	Mop Plate (at Inswing Doors)	J103
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottoms	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

POWER TRANSFERS FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

HW-9

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Lock	F08
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Closers	C02011/C02021
2	Heavy-Duty Armor Plates	J101 X 0.125-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottoms	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

INSTALL LOCK TRIM PROTECTOR BAR ON PUSH SIDE OF ACTIVE LEAF TO PROTECT LEVER TRIM.

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 8-THRUWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THRUWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Lock	F08
1	Electric Unlatch Strike	E09321 (FAIL SECURE)
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Armor Plates	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottoms	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

POWER TRANSFER **SHARED BY ELECTRIC STRIKE AND** REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Hospital Lock	F08 X PADDLES POINTING DOWN
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
1	Closers (at rated doors)	C02011/C02021
2	Heavy-Duty Armor Plates	J101 X 0.125-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS

INSTALL LOCK TRIM PROTECTOR BAR ON PUSH SIDE OF ACTIVE LEAF TO PROTECT LEVER TRIM.

HW-10C

Each Pair to Have: NON-RATED

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Utility Lock	F09
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Kick Plates	J102
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Lock	F08
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Kick Plates	J102
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-10E

Each Lead Lined Pair to Have: NON-RATED

2	Pivot Sets	C07162 X 1,000 LBS. WEIGHT CAPACITY
2	Intermediate Pivots	CO7311
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT x LEAD-LINED
1	Classroom Lock	F08 X LEAD-LINED X PADDLES POINTING DOWN
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS X LEAD-LINED
2	Armor Plates	J101 X 0.050-INCH THICKNESS
4	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Hospital Lock	F08 X PADDLES POINTING DOWN
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Heavy-Duty Armor Plates	J101 X 0.125-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

INSTALL LOCK TRIM PROTECTOR BAR ON PUSH SIDE OF ACTIVE LEAF TO PROTECT LEVER TRIM.

HW-10G

Each Pair to Have: NON-RATED

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Lock	F08
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Heavy-Duty Armor Plates	J101 X 0.125-INCH THICKNESS
1	Lock Trim Protector Bar	R111LPB-630 (ROCKWOOD), OR EQUAL
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

INSTALL LOCK TRIM PROTECTOR BAR ON PUSH SIDE OF ACTIVE LEAF TO PROTECT LEVER TRIM.

2	Bottom Pivots	C07162 LESS TOP PIVOT X 1,000 LBS. WEIGHT CAPACITY
1	Intermediate Pivot	C07311 (MIDDLE OF ACTIVE LEAF)
1	Intermediate Transfer Pivot	CO7311 X 4-WIRE TRANSFER (MIDDLE OF INACTIVE LEAF)
2	Intermediate Transfer Pivot	CO7311 X 4-WIRE TRANSFER (NEAR TOP OF EACH LEAF)
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT X LEAD-LINED
1	Hospital Utility Lock	F09 X PADDLES POINTING DOWN X LEAD-LINED
1	Electric Unlatch Strike	E09321 (FAIL SECURE) (LEAD-LINED)
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS X LEAD-LINED
2	Armor Plates	J101 X 0.050-INCH THICKNESS
4	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Overhead Stops	C01541-ADJUSTABLE
1	Set Self-Adhesive Seals	R0Y154

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

POWER TRANSFER PIVOTS NEAR TOP OF EACH DOOR FOR REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 8-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Hospital Lock	F08 X PADDLES POINTING DOWN
1	Electric Unlatch Strike	E09321 (FAIL-SECURE)
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Armor Plates	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Overhead Stops	C01541-ADJUSTABLE
1	Set Self-Adhesive Seals	R0Y154

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

POWER TRANSFERS **SHARED BY ELECTRIC STRIKE AND** REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

*AT WOOD PAIRS RATED 45 MINUTES OR MORE, PROVIDE ELECTRIC STRIKE 310-2-3/4 (FOLGER ADAM OR EQUAL) IN LIEU OF SPECIFIC UNLATCH STRIKE.

1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 8-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Lock	F08
1	Electric Unlatch Strike	E09321 (FAIL-SECURE)
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Armor Plates	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

POWER TRANSFER **SHARED BY ELECTRIC STRIKE AND** REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

*AT WOOD PAIRS RATED 45 MINUTES OR MORE, PROVIDE ELECTRIC STRIKE 310-2-3/4 (FOLGER ADAM OR EQUAL) IN LIEU OF SPECIFIC UNLATCH STRIKE.

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Classroom Lock	F08
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Kick Plates	J102
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-10M

Each Pair to Have: NON-RATED

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Utility Lock	F09
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Kick Plates	J102
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Storeroom Lock	F07
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Closers	C02011/C02021
2	Kick Plates	J102 (AT STORAGE ROOMS ONLY)
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-11A

Each Pair to Have: NON-RATED

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25
1	Security Storeroom Lock	F13-MOD X RIGID OUTSIDE LEVER X KEY RETRACTS DEADBOLT AND LATCHBOLT
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Armor Plates	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Set Auto Flush Bolts	TYPE 25
1	Storeroom Lock	F07
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Closers	C02011/C02021
2	Armor Plates	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-11C

Each Pair to Have:		RATED/NR
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Storeroom Lock	F07
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Closers	C02011/C02021
2	Kick Plates	J102 (AT STORAGE ROOMS ONLY)
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottoms	R0Y346 – HEAVY DUTY
2	Set Self-Adhesive Seals	R0Y154

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Exit Device	TYPE 7 OR 8 F01
1	Exit Device	TYPE 7 OR 8 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Set Meeting Stile Astragals	R0Y834
2	Closers	C02011/C02021
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-12A

Each [MHO] Pair Integrated Doors to Have: RATED

ALL HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

HW-12B

Each [ADO] Pair Integrated Doors to Have: RATED

1 Key Cylinder TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

HW-12C

Each [MHO] Pair Integrated Double Egress Doors to Have: RATED

ALL HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

HW-12D

Each [ADO] Pair Integrated Double Egress Doors to Have: RATED

ALL HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL
		X HOSPITAL TIP X ADJUSTA-SCREWS
1	Exit Device	TYPE 7 OR 8 F01
1	Exit Device	TYPE 7 OR 8 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Set Meeting Stile Astragals	R0Y834
2	Closers	C02011/C02021
2	Kick Plates	J102
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
2	Door Bottom	R0Y434 X NYLON BRUSH INSERT
2	Set Self-Adhesive Seals	R0Y154

HW-12F

Each Pair to Have:		RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Exit Device	TYPE 7 OR 8 F01
1	Exit Device	TYPE 7 OR 8 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Set Meeting Stile Astragals	R0Y834
2	Closers	C02021
2	Floor Stops	L02121 X 3 FASTENERS
2	Door Bottom	R0Y434 X NYLON BRUSH INSERT
2	Sets Self-Adhesive Seals	R0Y154

2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Exit Device	TYPE 7 OR 8 F01
1	Exit Device	TYPE 7 OR 8 F08 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Set Meeting Stile Astragals	R0Y834
2	Closers	C02051/C02071
2	Kick Plates	J102
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
2	Auto Door Bottoms	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-12H

Each [ADO] Pair to Have: NON-RATED

2	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 8-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Elec. Exit Device	TYPE 7 OR 8 F01 (E04)
1	Elec. Exit Device	TYPE 7 OR 8 F08 LEVER (E04)
1	Key Cylinder	TYPE AS REQUIRED
1	Power Supply	BY EXIT DEVICE MFR. FOR E04 FUNCTION
1	Set Meeting Stile Astragals	R0Y834
2	Kick Plates	J102
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
2	Auto Door Bottoms	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

POWER TRANSFERS **SHARED BY ELECTRIC PANIC AND** REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

AUTO DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13.

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Exit Device	TYPE 7 OR 8 F01
1	Exit Device	TYPE 7 RO 8 F13 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Set Meeting Stile Astragals	R0Y834
2	Closers	C02011/C02021
2	Floor Stops	L02121 X 3 FASTENERS
2	Auto Door Bottoms	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-13

Each [ADO] Bi-Parting Automatic Pair to Have: NON-RATED

ALL HARDWARE BY SECTION 08 42 29.

EXTERIOR SINGLE DOORS

HW-E1

Each Door to Have: NON-RATED

1	Continuous Hinge	
1	Entry Lock	F11
1	Latch Protector (outswing dr)	
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold (outswing door)	J32120 X SILICONE GASKET
1	Threshold (inswing door)	ALUMINUM, PER ARCHITECTURAL DETAIL
1	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

1	Continuous Hinge	
1	Classroom Lock	F05
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold (outswing door)	J32120 X SILICONE GASKET
1	Threshold (inswing door)	ALUMINUM, PER ARCHITECTURAL DETAIL
1	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

HW-E3

Each Door to Have: NON-RATED

1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Storeroom Lock	F13-MOD X RIGID OUTSIDE LEVER X KEY RETRACTS DEADBOLT AND LATCHBOLT
1	Latch Protector (outswing dr)	
1	Closer	C02011/C02021
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Armor Plate	J101 X 0.125-INCH THICKNESS
1	Overhead Holder	C01511-ADJUSTABLE
1	Threshold (outswing door)	J32120 X SILICONE GASKET
1	Threshold (inswing door)	ALUMINUM, PER ARCHITECTURAL DETAIL
1	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

HW-E4

Each Door to Have: NON-RATED

1	Continuous Hinge	
1	Anti-Vandal Pull	
1	Exit Device	TYPE 1 F03 LESS TRIM
1	Latch Protector (outswing door)	
1	Key Cylinder	TYPE AS REQUIRED
1	Closer	C02011
1	Kick Plate	J102
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32120 X SILICONE GASKET
1	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

HW-E5

Each Roll-up Door to Have: NON-RATED

1	Padlock or 2 Cylinders	TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 08 33 00, COILING DOORS AND GRILLES

EXTERIOR PAIRS OF DOORS

Each Pair to Have:		HW-E6 NON-RATED
2	Continuous Hinge	
1	Set Auto Flush Bolts	TYPE 25
1	Dust Proof Strike	L04021
1	Entry Lock	F11
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
1	Coordinator	TYPE 21A
2	Closer	C02011/C02021
2	Kick Plate	J102
2	Floor Stop	L02121 X 3 FASTENERS
1	Threshold (outswing door)	J32120 X SILICONE GASKET
1	Threshold (inswing door)	ALUMINUM, PER ARCHITECTURAL DETAIL
2	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

2	Continuous Hinge	
1	Set Auto Flush Bolts	TYPE 25
1	Dust Proof Strike	L04021
1	Classroom Lock	F05
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
1	Coordinator	TYPE 21A
2	Closer	C02011/C02021
2	Kick Plate	J102
2	Floor Stop	L02121 X 3 FASTENERS
1	Threshold (outswing door)	J32120 X SILICONE GASKET
1	Threshold (inswing door)	ALUMINUM, PER ARCHITECTURAL DETAIL
2	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

2	Continuous Hinge	
1	Set Auto Flush Bolts	TYPE 25
1	Dust Proof Strike	L04021
1	Storeroom Lock	F13-MOD X RIGID OUTSIDE LEVER X KEY RETRACTS DEADBOLT AND LATCHBOLT
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
1	Coordinator	TYPE 21A
2	Closer	C02011/C02021
2	Armor Plate	J101 X 0.125-INCH THICKNESS
2	Floor Stop	L02121 X 3 FASTENERS
1	Threshold (outswing door)	J32120 X SILICONE GASKET
1	Threshold (inswing door)	ALUMINUM, PER ARCHITECTURAL DETAIL
2	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

2	Continuous Hinge	
1	Exit Device	TYPE 8 F01
1	Exit Device	TYPE 8 F12 LESS PULL
1	Key Cylinder	TYPE AS REQUIRED
2	Latch Protectors (outswing door)	
1	Set Meeting Stile Astragals	R0Y834
2	Closer	C02011
2	Kick Plate	J102
2	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32120 X SILICONE GASKET
2	Door Sweep	R0416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

HW-E10

Each Sliding Door to Have: NON-RATED

1	Set Track Hardware	TYPE REQUIRED FOR DOOR MATERIAL, WEIGHT, AND MOUNTING DETAILS (COMPLETE WITH TRACK, TRACK BRACKETS, HANGERS, GUIDES, BUMPERS, AND INTERNAL TRACK STOPS)
2	Pulls	TYPE AS REQUIRED
1	Sliding Door Lock	E8281/E8291 (SLIDING DOOR LOCK)
2	Cylinder (for sliding door lock)	TYPE AS REQUIRED

EXTERIOR SINGLE GATES

HW-G1

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G2

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G3

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G4

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G5

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

EXTERIOR PAIRS OF GATES

HW-G6

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G7

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G8

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G9

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-G10

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

RESIDENTIAL UNIT SINGLE DOORS

HW-R1

Each Door to Have:		NON-RATED/RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Guestroom Card Lock	BY OTHER SECTION.
1	Closer (at Rated Doors)	C02011
1	Floor Stop	L02121 X 3 FASTENERS
2	Door Viewers	L03221 – 190°
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-R1A

Each Door to Have:		NON-RATED
1	Continuous Hinge	
1	Guestroom Card Lock	BY OTHER SECTION.
1	Latch Protector (at O/S Drs)	
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Floor Stop (at I/S Doors)	L02121 X 3 FASTENERS
1	Overhead Stop (at O/S Doors)	C01541-ADJUSTABLE
1	Threshold (outswing door)	J32120 X SILICONE GASKET
1	Threshold (inswing door)	ALUMINUM, PER ARCHITECTURAL DETAIL
1	Door Sweep	R0Y416
1	Set Frame Seals	R0Y164
1	Drip	R0Y976

HW-R2

Each Door to Have:		NON-RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Latchset	F75
1	Base Stop	L02031 x 3 FASTENERS
3	Silencers	L03011

HW-R2A

Each Door to Have: NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Door Pull with Plate	J401 X J302
1	Push Plate	J302
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Closer	C02011/C02021
1	Floor Stop	L02121 X 3 FASTENERS
3	Silencers	L03011

HW-R2B

Each Door to Have: NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Latchset	F75
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-R2C

Each Door to Have: NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Door Pull w/Plate	J401 X J302
1	Push Plate	J302
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Closer	C02011/C02021
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

HW-R3

Each Door to Have: NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Privacy	F76B
1	Base Stop	L02031 X 3 FASTENERS
1	Coat Hook	L03121
3	Silencers	L03011

HW-R3A

Each Door to Have: NON-RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Privacy	F76B
1	Base Stop	L02031 X 3 FASTENERS
1	Coat Hook	L03121
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

AT TOILET ROOMS, OMIT METAL THRESHOLD; STONE THRESHOLD BY OTHER TRADES.

HW-R4

Each Door to Have: RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Classroom Lock	F84
1	Closer	C02011/C02021
1	Base Stop	L02031 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-R5

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

RESIDENTIAL UNIT PAIRS OF DOORS

HW-R6

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-R7

Each Pair to Have:		NON-RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
2	Dummy Sets	
2	Roller Latches	E09091 X MORTISE STRIKE
2	Base Stops	L02031 X 3 FASTENERS
2	Silencers	L03011

HW-R7A

Each Door to Have:		NON-RATED/RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Set Auto Flush Bolts	TYPE 25 LESS BOTTOM BOLT
1	Guestroom Card Lock	BY OTHER SECTION.
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Closer (at Rated Doors)	C02011
2	Floor Stop	L02121 X 3 FASTENERS
2	Door Viewers	L03221 – 190°
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

SECURITY HARDWARE ABBREVIATIONS LEGEND:

AC = Access Control Device (Card reader, biometric reader, keypad, etc.)
ADO = Automatic Door Operator
DEML = Delayed Egress Magnetic Lock
DEPH = Delayed Egress Panic Exit Device
DPS = Door Position Switch (Door or Alarm Contact)
EL = Electric Lock or Electric Lever Exit Device
PB = Push-button Combination Lock (Stand-alone)
RR = Remote Release Button
ELR = Electric Latch Retraction Exit Device
REX = Request-to-Exit Switch in Latching Device Inside Trim

INTERIOR SINGLE SECURITY DOORS

HW-SH-1

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-SH-2

Each Door to Have:		NON RATED
1	Continuous Hinge	
1	Door Pull with Plate	J401 X J302
1	Lock	DETENTION TYPE LOCK
1	Strike/Keeper	AS REQUIRED
1	Overhead Stop	C01541-ADJUSTABLE X SEC. TORX
1	Door Position Switch	

HW-SH-3

Each [AC, EL, REX, DPS] Door to Have:		RATED/NON-RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Transfer Hinge	4-WIRE TYPE AS REQUIRED
1	Electrified Lock	F07 (E01-REX, E06) 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Closer	C02011/C02021
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154
1	Alarm Contact	

120-VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-SH-3A

THIS SET NOT USED.

HW-SH-3B

Each [PB] Door to Have:		RATED
1	Continuous Hinge	
1	Push-button Combination Lock	N3 – A156.13 F07 G1 E 06
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-SH-3C

Each [PB] Door to Have:		NON-RATED/RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS
1	Push-button Combination Lock	N3 – A156.13 F07 G1 E06
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 x 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

HW-SH-3D

Each [AC, EL, REX, DPS] Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Electrified Lock	F07 (E01-REX, E06) 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154
1	Alarm Contact	

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-SH-3E

Each [AC, EL, REX, DPS] Door to Have:		RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Transfer Hinge	4-WIRE TYPE AS REQUIRED
1	Electrified Occupancy Indicator Lock	F13-MODIFIED (E01-REX, E06) 24V DC X OCCUPANCY INDICATOR X KEY RETRACTS LATCHBOLT AND DEADBOLT X INTERNAL DEADBOLT MONITOR SWITCH
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Closer	C02011/C02021
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154
1	Alarm Contact	

INTERNAL DEADBOLT MONITOR SWITCH SHUNTS ACCESS CONTROL DEVICE WHEN DEADBOLT IS THROWN.

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-SH-3F

Each [AC, RR, EL, REX, DPS] Door to Have:		RATED
1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Electrified Lock	F13-MOD X RIGID OUTSIDE LEVER X NO INSIDE TURN X KEY RETRACTS LATCHBOLT AND DEADBOLT (E01-REX, E06) 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154
1	Alarm Contact	

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

RATED

HW-SH-3G

Each [AC, RR, EL, REX, DPS] Door to Have:

1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Electrified Lock	F13-MOD X RIGID OUTSIDE LEVER X NO INSIDE TURN X KEY RETRACTS LATCHBOLT AND DEADBOLT (E01-REX, E06) 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Self-Adhesive Seals	R0Y154
1	Alarm Contact	

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

RATED

1	Continuous Transfer Hinge	x 4-THRUWIRE TRANSFER x IN-HINGE ACCESS PANEL
1	Electrified Lock	F13-MOD x RIGID OUTSIDE LEVER X KEY RETRACTS LATCHBOLT AND DEADBOLT (E01-REX, E06) 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Floor Stop	L02121 x 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154
1	Door Viewer	L03221 – 190°
1	Alarm Contact	

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-SH-4

Each [AC, EL, REX, DPS] Integrated Door to Have: RATED

1	Key Cylinder	TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

HW-SH-4A

Each [ADO, AC, ELR, REX, DPS] Integrated Door to Have: RATED

1	Key Cylinder	TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

		RATED
1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 12-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Electrified Exit Device	TYPE 1 (E01-REX, E06) F13 LEVER
1	Key Cylinder	TYPE AS REQUIRED
1	Power Supply	TYPE REQUIRED BY PANIC MANUFACTURER X ADO BOARD
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

POWER TRANSFER **SHARED BY ELECTRIC PANIC AND** REACTIVATION SENSOR WIRING (REACTIVATION SENSORS PROVIDED BY SECTION 08 71 13).

AUTOMATIC DOOR OPERATOR AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

HW-SH-5

			RATED
2	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 12 THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL	
2	Electrified Exit Device	TYPE 1 (E01-REX, E06) F13 LEVER	
2	Key Cylinder	TYPE AS REQUIRED	
1	Power Supply	TYPE REQUIRED BY PANIC MANUFACTURER X ADO BOARD	
2	Closers	C02011/C02021	
1	Removable Mullion		
2	Armor Plate	J101 X 0.050-INCH THICKNESS	
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE	
2	Floor Stop	L02121 X 3 FASTENERS	
2	Threshold	J32300 X 2-1/4-INCH WIDTH	
2	Auto Door Bottom	R0Y346 – HEAVY DUTY	
2	Set Self-Adhesive Seals	R0Y154	
2	Alarm Contacts		

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-SH-6

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

INTERIOR PAIRS OF SECURITY DOORS

HW-SH-7

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-SH-8

THIS HARDWARE SET LEFT INTENTIONALLY BLANK AT THIS TIME.

HW-SH-9 RATED

Each [AC, EL, REX, DPS] Pair to Have: RATED

	Hinges	QUANTITY AND TYPE AS REQUIRED
1	Transfer Hinge	4-WIRE TYPE AS REQUIRED
1	Set Auto Flush Bolts	TYPE 25
1	Dust Proof Strike	L04021
1	Electrified Lock	F07 (E01-REX, E06) 24V DC
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Coordinator	TYPE 21A
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 x R0Y154 X THROUGH-BOLTS
2	Closers	C02011/C02021
2	Kick Plates	J102 (AT STORAGE ROOMS ONLY)
2	Floor Stops	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154
2	Alarm Contacts	

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-SH-9A

Each [PB] Pair to Have:		RATED	RATED
2	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL	
		X ADJUSTA-SCREWS	
1	Set Auto Flush Bolts	TYPE 25	
1	Dust Proof Strike	L04021	
1	Push-button Combination Lock	N3 – A156.13 F07 G1 E06	
1	Coordinator	TYPE 21A	
1	Overlapping Astragal with Self-Adhesive Seal	R0Y634 X R0Y154 X THROUGH-BOLTS	
2	Closers	C02011/C02021	
2	Armor Plates	J101 X 0.050-INCH THICKNESS	
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE	
2	Floor Stops	L02121 X 3 FASTENERS	
1	Set Self-Adhesive Seals	R0Y154	

HW-SH-10

Each [AC, EL, REX, DPS] Pair Integrated Doors to Have:		RATED
1	Key Cylinder	TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

HW-SH-10A

Each [AC, ADO, EL, REX, DPS] Pair Integrated Doors to Have:		RATED
1	Key Cylinder	TYPE AS REQUIRED

BALANCE OF HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES. AUTOMATIC DOOR OPERATORS AND CONTROLS BY SECTION 08 71 13, AUTOMATIC DOOR OPERATORS.

EXTERIOR SINGLE SECURITY DOORS

		RATED
	HW-SH-12	
Each [AC, ELR, REX, DPS] Integrated Door to Have:		NON-RATED
1 Key Cylinder	TYPE AS REQUIRED	

BALANCE OF HARDWARE BY SECTION 08 17 10, INTEGRATED DOOR ASSEMBLIES

MENTAL HEALTH AREAS

	HW-MH1	
Each Door to Have:		NON-RATED/RATED
1 Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL	
	X HOSPITAL TIP X ADJUSTA-SCREWS	
1 Passage Latch	F01 X LESS TRIM	
1 Set Anti-Ligature Trim		
1 Armor Plate	J101 X 0.050-INCH THICKNESS	
1 Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE	
1 Floor Stop	L02121 X 3 FASTENERS	
1 Set Seals	R0Y164	

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

NO CLOSER REQUIRED DUE TO EXEMPTION FOR PATIENT ROOM DOORS.

HW-MH1A

Each Door to Have:		RATED	RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED	
		X HOSPITAL TIPS	
1	Passage Latch	F01 X LESS TRIM	
1	Set Anti-Ligature Trim		
1	Closer	C02011/C02021	
		X INSTALL OUTSIDE ROOM	
1	Kick Plate	J102	
1	Mop Plate (at Inswing Doors)	J103	
1	Floor Stop	L02121 X 3 FASTENERS	
1	Threshold	J32300 X 2-1/4-INCH WIDTH	
1	Auto Door Bottom	R0Y346 – HEAVY DUTY	
1	Set Seals	R0Y164	

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

HW-MH1B

Each Door to Have:		RATED/NON-RATED
1	Continuous Hinge	X HOSPITAL TIP
1	Passage Latch	F01 X LESS TRIM
1	Set Anti-Ligature Trim	
1	Kick Plate	J102
1	Closer (at rated doors)	C02011/C02021
1	Wall Stop	L02101 CONVEX
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
2	Sets Self-Adhesive Seals	R0Y154

INSTALL CLOSER OUTSIDE ROOM.

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

HW-MH-2

Each Door to Have:		RATED NON-RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED X HOSPITAL TIP
1	Keyed Privacy Lock	F12-MOD X TURNPIECE BOTH SIDES X LESS TRIM
1	Set Anti-Ligature Trim	
2	Anti-Ligature Thumbturns	
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Floor Stop	L02121 X 3 FASTENERS
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Seals	R0Y164

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

STONE THRESHOLD BY OTHER TRADES.

HW-MH2A

Each Door to Have:		RATED/NON-RATED
	Hinges	QUANTITY AND TYPE AS REQUIRED X HOSPITAL TIP
1	Keyed Privacy Indicator Lock	F13 X OCCUPANCY INDICATOR X LESS TRIM
1	Set Anti-Ligature Trim	
1	Anti-Ligature Thumbturn	
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Mop Plate (at Inswing Doors)	J103
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

INSTALL CLOSER OUTSIDE ROOM

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

STONE THRESHOLD BY OTHER TRADES.

HW-MH-3

Each Door to Have:		RATED NON-RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
1	Classroom Lock	F05 X LESS TRIM
1	Set Anti-Ligature Trim	CH (Accurate Lock), or equal
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Mop Plate	J103
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
3	Silencers	L03011

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

HW-MH3A

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
1	Classroom Lock	F05 X LESS TRIM
1	Set Anti-Ligature Trim	CH (Accurate Lock), OR EQUAL
1	Closer	C02011/C02021
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Set Self-Adhesive Seals	R0Y154

INSTALL CLOSER OUTSIDE ROOM.

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

HW-MH4

Each [AC, RR, EL, REX, DPS] Door to Have:		RATED
1	Continuous Transfer Hinge	X INTEGRAL HINGE GUARD CHANNEL X ADJUSTA-SCREWS X 4-THROUGHWIRE TRANSFER X IN-HINGE ACCESS PANEL
1	Electrified Lock	F07 (E01-REX, E06) 24V DC X LESS TRIM
1	Set Anti-Ligature Trim	
1	Power Supply	REGULATED, FILTERED, 24V DC, AMPERAGE AS REQUIRED
1	Closer	C02011/C02021
1	Kick Plate	J102
1	Stretcher Plate	J101
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Door Viewer	L03221 – 190° (VIEW INTO WAITING ROOM)
1	Door Viewer	L03221 – 190° (VIEW INTO TREATMENT AREA)
1	Set Self-Adhesive Seals	R0Y154
1	Alarm Contact	1078-G (G.E. SECURITY), OR EQUAL

OMIT DOOR VIEWERS AT DOORS WITH VISION LITES.

INSTALL DOOR CLOSER ON WAITING ROOM SIDE.

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

120VAC POWER, CONDUIT, AND WIRING BY DIVISION 26.

CARD READER BY DIVISION 28.

HW-MH4A

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
1	Lock	F08 X LESS TRIM
1	Set Anti-Ligature Trim	
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Seals	R0Y164

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

NO CLOSER REQUIRED DUE TO EXEMPTION FOR PATIENT ROOM DOORS.

HW-MH5

Each Door to Have:		RATED/NON-RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
2	Anti-Ligature Pulls	
1	Deadlatch	F30 LESS TRIM BOTH SIDES
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Floor Stop	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
1	Auto Door Bottom	R0Y346 – HEAVY DUTY
1	Set Seals	R0Y164

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

NO CLOSER REQUIRED AT RATED DOORS DUE TO EXEMPTION FOR PATIENT ROOM DOORS.

HW-MH5A

Each Door to Have:		RATED
1	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
2	Anti-Ligature Pulls	
1	Deadlatch	F30 LESS TRIM BOTH SIDES
1	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
1	Armor Plate	J101 X 0.050-INCH THICKNESS
1	Floor Stop	L02121 X 3 FASTENERS
3	Silencers	L03011

STONE THRESHOLD BY OTHER TRADES.

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

HW-MH6

Each Pair to Have:		RATED/NON-RATED
2	Continuous Hinges	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
2	Anti-Ligature Pulls (act. lf)	
2	Manual Flush Bolts	L04251/L04261 (VERIFY)
1	Dust Proof Strike	L04021
1	Deadlatch	F30 LESS TRIM BOTH SIDES
1	Overlapping Astragal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Armor Plates	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stops	L02121 X 3 FASTENERS
1	Threshold	J32300 X 2-1/4-INCH WIDTH
2	Auto Door Bottom	R0Y336 – HEAVY DUTY
1	Set Seals	R0Y164

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

HW-MH6A

Each Pair to Have:		NON-RATED/RATED
2	Continuous Hinge	X INTEGRAL HINGE GUARD CHANNEL X HOSPITAL TIP X ADJUSTA-SCREWS
2	Manual Flush Bolts	L04251/L04261 (VERIFY)
1	Dust Proof Strike	L04021
1	Passage Latch	F01 X LESS TRIM
1	Set Anti-Ligature Trim	
1	Overlapping Astragal	R0Y634 X R0Y154 X THROUGH-BOLTS
2	Armor Plate	J101 X 0.050-INCH THICKNESS
2	Edge Guard (at Wood Doors)	J208M/J211 (VERIFY), CUT: HARDWARE
2	Floor Stop	L02121 X 3 FASTENERS
1	Set Seals	R0Y164

PROVIDE SECURITY FASTENERS FOR ALL HARDWARE ITEMS.

NO CLOSER REQUIRED DUE TO EXEMPTION FOR PATIENT ROOM DOORS.

- - - E N D - - -

SECTION 08 80 00
GLAZING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies glass-related glazing materials and accessories. Glazing products specified apply to field-glazed items.

1.2 RELATED WORK

A. Glazing in Hollow Metal Doors: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.

B. Glazing in Wood Doors: Section 08 14 00, INTERIOR WOOD DOORS.

C. Glazing in Aluminum Doors and Storefront Applications: Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.

D. Glazing for Mirrors: Section 10 28 00, TOILET, BATH, AND LAUNDRY ACCESSORIES.

1.3 LABELS

A. Temporary Labels:

1. Provide temporary label on each light of glass identifying manufacturer or brand and glass type, quality and nominal thickness.
2. Label in accordance with NFRC (National Fenestration Rating Council) label requirements.
3. Temporary labels shall remain intact until glass is approved by Contracting Officer’s Representative (COR).

B. Permanent Labels:

1. Locate in corner for each pane.
2. Label in accordance with ANSI Z97.1 and SGCC (Safety Glass Certification Council) label requirements.
   a. Tempered glass.
   b. Laminated glass or have certificate for panes without permanent label.

1.4 PERFORMANCE REQUIREMENTS

A. Glass Thickness: Thicknesses listed are minimums. Coordinate thicknesses with framing system manufacturers.

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Warranty: Submit written guaranty, conforming to General Condition requirements, and to “Warranty of Construction” Article in this Section.

C. Manufacturer's Literature and Data:

1. Glass, each kind required.
3. Elastic compound for metal sash glazing.
4. Glazing cushion.
5. Sealing compound.

D. Samples:

1. Size: 6 inches by 6 inches.

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 safety glazing units against face and edge damage during entire sequence of fabrication, handling, and delivery to installation location.

1. Treat security 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 shall 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.
2. Temporary Protections: The glass front and back of glazing shall 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.

3. Edge Protection: To cushion and protect glass clad edges from contamination or foreign matter, the four edges shall be sealed the depth of glazing with continuous standard-thickness Santoprene tape. Alternatively, continuous channel-shaped extrusion of Santoprene shall be used, with flanges extending into face sides of glazing.

1.7 PROJECT CONDITIONS

A. Field Measurements: Field measure openings before ordering tempered glass products. Be responsible for proper fit of field measured products.

1.8 WARRANTY

A. Warranty: Conform to terms of "Warranty of Construction," FAR Clause 52.246-21, except extend warranty period for the following:

2. Laminated glass units are to remain laminated for 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 National Standards Institute (ANSI):

Z97.1-09.....Safety Glazing Material Used in Building - Safety Performance Specifications and Methods of Test.

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

C542-05.....Lock-Strip Gaskets

C716-06.....Installing Lock-Strip Gaskets and Infill Glazing Materials

C794-10.....Adhesion-in-Peel of Elastomeric Joint Sealants

C864-05.....Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers

C920-11.....Elastomeric Joint Sealants

C964-07.....Standard Guide for Lock-Strip Gasket Glazing

C1036-06.....Flat Glass

C1048-12.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.

C1376-10.....Pyrolytic and Vacuum Deposition Coatings on Flat Glass

D635-10.....Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastic in a Horizontal Position

D4802-10.....Poly (Methyl Methacrylate) Acrylic Plastic Sheet

E84-10.....Surface Burning Characteristics of Building Materials

E119-10.....Standard Test Methods for Fire Test of Building Construction and Material

E2190-10.....Insulating Glass Unit

D. Commercial Item Description (CID):

A-A-59502.....Plastic Sheet, Polycarbonate

E. Code of Federal Regulations (CFR):

16 CFR 1201 - Safety Standard for Architectural Glazing Materials; 2010

F. National Fire Protection Association (NFPA):

80-13.....Fire Doors and Windows

252-12.....Standard Method of Fire Test of Door Assemblies

257-12.....Standard on Fire Test for Window and Glass Block Assemblies

G. National Fenestration Rating Council (NFRC)

H. Safety Glazing Certification Council (SGCC) 2012:

Certified Products Directory (Issued Semi-Annually)

I. Underwriters Laboratories, Inc. (UL):

752-11.....Bullet-Resisting Equipment

J. Unified Facilities Criteria (UFC):

4-010-01-2012.....DOD Minimum Antiterrorism Standards for Buildings

K. Glass Association of North America (GANA):

Glazing Manual (Latest Edition)

Sealant Manual (2009)

L. American Society of Civil Engineers (ASCE):

ASCE 7-10.....Wind Load Provisions

PART 2 - PRODUCT

2.1 GLASS

A. Use thickness stated unless specified otherwise in assemblies.

B. Clear Glass:

1. ASTM C1036, Type I, Class 1, Quality q3.

2. Thickness, 1/4-inch.
3. Coordinate color/tint/coating to accommodate required security monitoring.

2.2 HEAT-TREATED GLASS

A. Clear Tempered Glass:
1. ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.
2. Thickness, 1/4-inch.

2.3 LAMINATED GLASS

A. Two or more lites of glass bonded with an interlayer material for use in building glazing
B. Use 0.060-inch-thick interlayer for: Fully tempered glass assemblies.
C. Use minimum 0.030-inch-thick interlayer for vertical glazing where 0.060-inch interlayer is not otherwise shown or required.

2.4 LAMINATED GLAZING ASSEMBLIES

A. Clear Glazing:
1. Both panes clear glass ASTM C1036, Type I, Class 1, Quality q3.
2. Thickness: Each pane, 1/8-inch thick.
B. Clear Tempered Glazing:
1. Both panes ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.
2. Thickness: Each pane 3/16-inch thick.

2.5 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 shall have a finish that will not corrode or stain while in service.
B. Setting Blocks: ASTM C864:
1. Channel shape; having 1/4-inch internal depth.
2. Shore A hardness of 80 to 90 Durometer.
3. Block Lengths: 2 inches except 4 to 6 inches for insulating glass.
4. Block Width: Approximately 1/6-inch less than the full width of the rabbet.
5. Block Thickness: Minimum 3/16-inch. Thickness sized for rabbet depth as required.
C. Spacers: ASTM C864:
1. Channel shape having a 1/4-inch internal depth.
2. Flanges not less 3/32-inch-thick and web 1/8-inch thick.

3. Lengths: 1 to 3 inches.
4. Shore A hardness of 40 to 50 Durometer.

D. Sealing Tapes:
1. Semi-solid polymeric based 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.

E. Spring Steel Spacer: Galvanized steel wire or strip designed to position glazing in channel or rabbeted sash with stops.

F. Glazing Clips: Galvanized steel spring wire designed to hold glass in position in rabbeted sash without stops.

G. Glazing Points (Sprigs): Pure zinc stock, thin, flat, triangular- or diamond-shaped pieces, 1/4-inch minimum size.

H. 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.

I. Lock-Strip Glazing Gaskets: ASTM C542, shape, size, and mounting as indicated.

J. Glazing Sealants: ASTM C920, silicone neutral cure:
1. Type S.
2. Class 25
3. Grade NS.
4. Shore A hardness of 25 to 30 Durometer.

K. Structural Sealant: ASTM C920, silicone acetoxy cure:
1. Type S.
2. Class 25.
3. Grade NS.
4. Shore A hardness of 25 to 30 Durometer.

L. Neoprene, EPDM, or Vinyl Glazing Gasket: ASTM C864.
1. Channel shape; flanges may terminate above the glazing channel or flush with the top of the channel.
2. Designed for dry glazing.

M. Color:
   1. Color of glazing compounds, gaskets, and sealants used for aluminum color frames shall match color of the finished aluminum and be nonstaining.
   2. Color of other glazing compounds, gaskets, and sealants which will be exposed in the finished work and unpainted shall be black, gray, or neutral color.

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 to details, dimensions and tolerances indicated on manufacturer’s approved shop drawings.
B. Advise Contractor of 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 to prevent damage to glass and glazing units by cleaning materials.

3.2 PREPARATION

A. For sealant glazing, prepare glazing surfaces in accordance with GANA-02 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-01 Glazing Manual and GANA-02 Sealant Manual 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. Tempered Glass: Install with roller distortions in horizontal position unless otherwise directed.

F. Laminated Glass:

1. Tape edges to seal interlayer and protect from glazing sealants.
2. Do not use putty or glazing compounds.

3.4 REPLACEMENT AND CLEANING

A. Clean new glass surfaces removing temporary labels, paint spots, and defacement after approval by Contracting Officer’s Representative (COR).

B. Replace cracked, broken, and imperfect glass, or glass which has been installed improperly.

C. Leave glass, putty, and other setting material in clean, whole, and acceptable condition.

3.5 PROTECTION

A. Protect finished surfaces from damage during erection, and after completion of Work. Strippable plastic coatings on colored anodized finish are not acceptable.

3.6 GLAZING SCHEDULE

A. Tempered Glass:

1. Install in full and half-glazed doors unless indicated otherwise.
2. Install in storefront, windows, and door sidelights adjacent to doors.
3. Use clear tempered glass on interior sidelights and doors, and interior windows unless otherwise indicated or specified.

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SECTION 09 22 16
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies steel stud wall systems, shaft wall systems, ceiling or soffit suspended or furred framing, wall furring, fasteners, and accessories for the screw attachment of gypsum board, plaster bases or other building boards.

1.2 RELATED WORK

A. Load-Bearing Framing: Section 05 40 00, COLD-FORMED METAL FRAMING.
B. Support for Wall-Mounted Items: Section 05 50 00, METAL FABRICATIONS.
C. Installation of Gypsum Board: Section 09 29 00, GYPSUM BOARD.
D. Ceiling Suspension Systems for Acoustical Tile or Panels and Lay-In Gypsum Board Panels: Section 09 29 00, GYPSUM BOARD and Section 09 51 00, ACOUSTICAL CEILINGS.

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 shaft wall assembly.

4. Typical fire-rated assembly and column fireproofing showing details of construction same as that used in fire rating test.

D. Test Results: Fire rating test designation, each fire rating required for each assembly.

1.5 DELIVERY, IDENTIFICATION, HANDLING AND STORAGE

A. 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)

A641-09.....Zinc-Coated (Galvanized) Carbon Steel Wire
C11-10.....Terminology Relating to Gypsum and Related Building Materials and Systems
C635-07.....Manufacture, Performance, and Testing of Metal Suspension System for Acoustical Tile and Lay-in Panel Ceilings
C636-08.....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
E580-11.....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), rigid (hat section) furring channels, "Z" shaped furring channels, and resilient furring channels, with coating designation of G-60 minimum, per ASTM 123.

2.2 STEEL STUDS AND RUNNERS (TRACK)

A. ASTM C645, modified for thickness specified and sizes as shown.

1. Use ASTM A525 steel, 0.0359-inch-thick bare metal (20-gage), 4-inch studs.

2. Runners same thickness and size as studs.

B. Provide not less than 2 cutouts in web of each stud, approximately 12 inches from each end, and intermediate cutouts on approximately 24-inch centers.

C. Doubled studs for openings and studs for supporting concrete backer-board.

D. Studs 12 feet or less in length shall be in one piece.

E. Shaft Wall Framing:

1. Conform to rated wall construction.
2. C-H Studs.
3. E Studs.
4. J Runners.
5. Steel jamb-strut.

2.3 FURRING CHANNELS

A. Rigid Furring Channels (Hat Shape): ASTM C645.

B. Resilient Furring Channels:

1. Not less than 0.0179-inch-thick bare metal.
2. Semi-hat shape, only 1 flange for anchorage with channel web leg slotted on anchorage side, channel web leg on other side stiffens fastener surface but shall not contact anchorage surface other channel leg is attached to.

C. 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 Fire-Rated Construction: Type and size same as used in fire rating test.

C. Fasteners for Steel Studs Thicker Than 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), manufacturer’s 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. Manufacturer's standard items fabricated from zinc-coated (galvanized) steel sheet.
2. For Concrete or Masonry Walls: Metal slots with adjustable inserts or adjustable wall furring brackets. Spacers may be fabricated from 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.

PART 3 - EXECUTION

3.1 INSTALLATION CRITERIA

A. Where fire-rated construction is required for walls, partitions, columns, beams and floor-ceiling assemblies, the construction shall be same as that used in fire rating test.

B. Construction requirements for fire-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 wall studs in accordance with ASTM C754 Use 20-gage, 4-inch studs unless otherwise shown on Drawings.

B. Space studs as shown on Drawings, but not more than 24 inches on center.

C. Cut studs 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 fire, rated partitions, smoke partitions, shafts, and sound-rated partitions.

F. Openings:

1. Frame jambs of openings in stud partitions and furring with 2 studs placed back to back or as shown.
2. Fasten back-to-back studs together with 3/8-inch-long Type S pan head screws at not less than 2 feet on center, staggered along webs.
3. Studs fastened flange to flange shall have splice plates on both sides approximately 2 by 3 inches screwed to each stud with 2 screws in each stud. Locate splice plates at 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 2 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 2-1/2 inches wide.

I. Form control joint with double studs spaced 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 2-1/2-inch or narrower studs, 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 3-foot vertical intervals on side without finish.
   3. Securely fasten braces to each stud with 2 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 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 8 inches.
   4. Fasten furring channels to walls with power-actuated drive pins or hardened steel concrete nails. Where channels are spliced, provide 2 fasteners in each flange.
   5. Locate furring channels at interior and exterior corners in accordance with wall finish material manufacturers printed erection instructions. Locate "Z" channels within 4 inches of corner.

D. Installing Wall Furring-Bracket System: Space furring channels not more than 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, 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.

3.5 INSTALLING SHAFT WALL SYSTEM

A. Conform to UL Design U438 for 2-hour fire rating. Provide 2-hour fire-rated shaft walls where shown on Drawings.

B. Position J runners at floor and ceiling with the short leg toward finish side of wall. Securely attach runners to structural supports with power driven fasteners at both ends and 24 inches on center.

C. After liner panels have been erected, cut C-H studs and E studs, from 3/8-inch to not more than 1/2-inch less than floor-to-ceiling height. Install C-H studs between liner panels with liner panels inserted in the groove.

D. Install full-length steel E studs over shaft wall line at intersections, corners, hinged door jambs, columns, and both sides of closure panels.

E. Suitably frame all openings to maintain structural support for wall.

1. Provide necessary liner fillers and shims to conform to label frame requirements.
2. Frame openings cut within a liner panel with E studs around perimeter.
3. Frame openings with vertical E studs at jambs, horizontal J runner at head and sill.

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 16-inch centers for metal lath anchorage.
2. Space framing at 24-inch centers for gypsum board anchorage.

B. Where bar joists or beams are more than 48 inches apart, provide intermediate hangers so that spacing between supports does not exceed 48 inches. Use clips, bolts, or wire ties for direct attachment to steel framing.

C. Steel Decking Without Concrete Topping:

1. Do not fasten to steel decking 0.0299-inch or thinner.
2. Toggle bolt to decking 0.0359-inch or thicker only where anchorage to steel framing is not possible.

3.7 TOLERANCES

A. Fastening surface for application of subsequent materials shall not vary more than 1/8-inch from the layout line.

B. Plumb and align vertical members within 1/8-inch.

C. Level or align ceilings within 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 05 40 00, COLD-FORMED METAL FRAMING, and Section 09 22 16, NON-STRUCTURAL METAL FRAMING.

B. Acoustical Sealants: Section 07 92 00, JOINT SEALANTS.

C. Gypsum Base for Veneer Plaster: Section 09 26 00, VENEER PLASTERING.

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.

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

C475-02.....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
C1177-06.....Glass Mat Gypsum Substrate for Use as Sheathing
C1658-06.....Glass Mat Gypsum Panels
C1396-06.....Gypsum Board
E84-08.....Surface Burning Characteristics of Building Materials

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, Type X, 5/8-inch thick unless shown otherwise. Shall contain a minimum of 20 percent recycled gypsum.

B. Coreboard or Shaft Wall Liner Panels:
1. ASTM C1396, Type X.
2. ASTM C1658: Glass Mat Gypsum Panels, Type X.
3. Coreboard for shaft walls 12, 16, or 24 inches wide by required lengths 1 inch thick with paper faces treated to resist moisture.

C. Water Resistant Gypsum Backing Board: ASTM C620, Type X, 5/8-inch thick.

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

A. ASTM C1396, Type X, water-resistant core, 5/8-inch thick.

B. ASTM C1177, Type X.

2.3 ACCESSORIES

A. ASTM C1047, except form of 0.015-inch-thick zinc-coated steel sheet or rigid PVC plastic.

B. Flanges not less than 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 0.33-inch.

C. Select screws of size and type recommended by the manufacturer of the material being fastened.

D. For fire-rated construction, type and size same as used in fire 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

3.1 GYPSUM BOARD HEIGHTS

A. Extend all layers of gypsum board from floor to underside of structure overhead on following partitions and furring:

1. Two sides of partitions:
   a. Fire-rated partitions.
   b. Smoke partitions.
   c. Sound-rated partitions.
   d. Full height partitions (FHP) shown.
   e. Corridor partitions.
2. One side of partitions or furring:
   a. Inside of exterior wall furring or stud construction.
   b. Room side of room without suspended ceilings.
   c. Furring for pipes and duct shafts, except where fire-rated shaft wall construction is shown.
3. Extend all layers of gypsum board construction used for fireproofing of columns from floor to underside of structure overhead, unless shown otherwise.

B. In locations other than those specified, extend gypsum board from floor to heights as follows:

1. Not less than 4 inches above suspended acoustical ceilings.

2. At ceiling of suspended gypsum board ceilings.
3. At existing ceilings.

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 where shown and in locations which might be subject to moisture exposure during construction.

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 assembles:
      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 (Except Shaft Walls):
   1. When gypsum board is installed parallel to framing members, space fasteners 12 inches on center in field of the board, and 8 inches on center along edges.
   2. When gypsum board is installed perpendicular to framing members, space fasteners 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 2-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 3-ply gypsum board assemblies, apply plies in same manner as for 2-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 2-ply assembly, except use

fasteners of sufficient length enough to have the same penetration into framing members as required for 2-ply assemblies.

7. No offset in exposed face of walls and partitions will be permitted because of single-ply and 2-ply or 3-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 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 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.
3. For sound-rated partitions, use sealing compound (ASTM C919) to fill the annular spaces between all receptacle boxes and the partition finish material through which the boxes protrude to seal all holes and/or openings on the back and sides of the boxes. STC minimum values as shown.

I. Electrical and Telecommunications Boxes: 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 1 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-load bearing assemblies abut load bearing members.
d. Where shown.

3.3 INSTALLING GYPSUM SHEATHING

A. Install in accordance with ASTM C840, except as otherwise specified or shown.
B. Use screws of sufficient length to secure sheathing to framing.
C. Space screws 3/8-inch from ends and edges of sheathing and 8 inches on center. Space screws a maximum of 8 inches on center on intermediate framing members.
D. Apply 2-foot by 8-foot sheathing boards horizontally with tongue edge up.
E. Apply 4-foot by 8- or 9-foot gypsum sheathing boards vertically with edges over framing.

3.4 CAVITY SHAFT WALL

A. Coordinate assembly with Section 09 22 16, NON-STRUCTURAL METAL FRAMING, for erection of framing and gypsum board.
B. Conform to UL Design No. U438 or FM WALL CONSTRUCTION 12-2/HR (Non-bearing for 2-hour fire rating. Conform to FM WALL CONSTRUCTION 25-1/HR (Non-load-bearing) for 1-hour fire rating where shown.
C. Cut coreboard (liner) panels 1 inch less than floor-to-ceiling height, and erect vertically between J-runners on shaft side.
   1. Where shaft walls exceed 14 feet in height, position panel end joints within upper and lower third points of wall.
   2. Stagger joints top and bottom in adjacent panels.
   3. After erection of J-struts of opening frames, fasten panels to J-struts with screws of sufficient length to secure to framing staggered from those in base, spaced 12 inches on center.
D. Gypsum Board:
   1. Two-Hour Wall:
      a. Erect base layer (backing board) vertically on finish side of wall with end joints staggered. Fasten base layer panels to studs with 1-inch-long screws, spaced 24 inches on center.
      b. Use laminating adhesive between plies in accordance with UL or FM if required by fire test.
      c. Apply face layer of gypsum board required by fire test vertically over base layer with joints staggered and attach with screws of sufficient length to secure to framing staggered from those in base, spaced 12 inches on center.

2. One-Hour Wall With 1 Layer on Finish Side of Wall: Apply face layer of gypsum board vertically. Attach to studs with screws of sufficient length to secure to framing, spaced 12 inches on center in field and along edges.
3. Where coreboard is covered with face layer of gypsum board, stagger joints of face layer from those in the coreboard base.

E. Treat joints, corners, and fasteners in face layer as specified for finishing of gypsum board.

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, except use Level 5 behind reception desk for mural application as shown on Drawings.

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, fire-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, fire-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 nondecorated surfaces.

B. Patch holes or openings 1/2-inch or less in diameter, or equivalent size, with a setting type finishing compound or patching plaster.

C. Repair holes or openings over 1/2-inch diameter, or equivalent size, with 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.

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SECTION 09 30 13
CERAMIC/PORCELAIN TILING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies ceramic, porcelain tile, waterproofing membranes for thin-set applications, crack isolation membranes, and tile backer board.

1.2 RELATED WORK

A. Sealing of Joints where Specified: Section 07 92 00, JOINT SEALANTS.

B. Color, texture and pattern of field tile and trim shapes, size of field tile, trim shapes, and color of grout as indicated in the Finish Schedule on the Drawings.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Samples:

1. Base tile, each type, each color, each size.
2. Mosaic floor tile panels, 9 inches by 9 inches, each type, color, size and pattern.
3. Paver tile, each size, type, color and pattern.
4. Porcelain tile, each type, color, pattern and size.
5. Wall (or wainscot) tile, each color, size and pattern.
6. Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, color, and size.

C. Product Data:

1. Porcelain tile, marked to show each type, size, and shape required.
2. Cementitious backer unit.
3. Dry-set Portland cement mortar and grout.
4. Elastomeric membrane and bond coat.
5. Reinforcing tape.
6. Leveling compound.
7. Latex-Portland cement mortar and grout.
8. Commercial Portland cement grout.
9. Slip resistant tile.
10. Waterproofing isolation membrane.
11. Fasteners.

D. Certification:

1. Master grade, ANSI A137.1.

2. Manufacturer's certificates indicating that the following materials comply with Specification requirements:
   a. Chemical-resistant mortar and grout (epoxy and furan).
   b. Modified epoxy emulsion.
   c. Commercial Portland cement grout.
   d. Cementitious backer unit.
   e. Dry-set Portland cement mortar and grout.
   f. Elastomeric membrane and bond coat.
   g. Reinforcing tape.
   h. Latex-Portland cement mortar and grout.
   i. Leveling compound.
   j. Waterproof isolation membrane.
   k. Factory-mounted tile suitability for application in wet area specified under 2.1, A., 3. with list of successful in-service performance locations.

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 National Standards Institute (ANSI):

A108.1A-11.....Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar

A108.1B-11.....Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with dry-Set or latex-Portland Cement Mortar

A108.1C-11.....Contractors Option; Installation of Ceramic Tile in the Wet-Set method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar

A137.1-08.....Ceramic Tile

C. American Society For Testing And Materials (ASTM):

A185-07.....Steel Welded Wire Fabric, Plain, for Concrete Reinforcing

C109/C109M-11.....Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch. or [50-mm] Cube Specimens)
C241-09.....Abrasion Resistance of Stone Subjected to Foot Traffic
C348-08.....Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars
C627-10.....Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester
C954-11.....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
C979-10.....Pigments for Integrally Colored Concrete
C1002-07.....Steel Self-Piercing Tapping Screws for the Application of Panel Products
C1027-09.....Determining “Visible Abrasion Resistance on Glazed Ceramic Tile”
C1028-07.....Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method
C1127-09.....Standard Guide for Use of High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with an Integral Wearing Surface
C1178/C1178M-11.....Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel
C1325-08.....Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units
D4397-10.....Standard Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications
D5109-99(R2004).....Standard Test Methods for Copper-Clad Thermosetting Laminates for Printed Wiring Boards

D. Tile Council of America, Inc. (TCA):
2007.....Handbook for Ceramic Tile Installation

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. Abrasion Resistance Classification:
   a. Tested in accordance with values listed in Table 1, ASTM C1027.
   b. Class V, 12,000 revolutions for floors in corridors, kitchens, storage including refrigerated rooms
   c. Class IV, 6,000 revolutions for remaining areas.
3. Slip-Resistant Tile for Floors:
   a. Coefficient of friction, when tested in accordance with ASTM C1028, required for level of performance:
      1) Not less than 0.7 (wet condition) for bathing areas.
      2) Not less than 0.8 on ramps for wet and dry conditions.
      3) Not less than 0.6, except 0.8 on ramps as stated above, for wet and dry conditions for other areas.
   b. Porcelain Paver Tile: Matte surface finish with raised ridges spaced uniformly over tile surface.
4. Mosaic tile may be mounted or joined together by a resinous bonding material along tile edges.
5. Do not use back-mounted tiles in showers unless certified by manufacturer as noted in paragraph 1.3,D.
6. 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 package show the same range in colors as those taken from other packages and match approved samples.
7. 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 petroleum paraffin wax, applied hot.
   b. Do not coat unexposed tile surfaces.
   c. Pre-wax tiles set or grouted with latex modified mortars.

B. Unglazed Ceramic Mosaic Tile: Nominal ¼-inch thick with cushion edges.

C. Glazed Wall Tile: Cushion edges, glazing, as indicated in the Finish Schedule on the Drawings.

D. Porcelain Paver Tile: Nominal 5/16-inch thick, with cushion edges. Porcelain tile produced by the dust pressed method shall be made of approximately 50 percent feldspar; the remaining 50 percent shall be made up of various high-quality light-firing ball clays yielding a tile with a water absorption rate of 0.5 percent or less and a breaking strength of between 390 to 400 pounds.

E. Trim Shapes:
   1. Conform to applicable requirements of adjoining floor and wall tile.

2. Use slip-resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and seats.
3. Use trim shapes sizes conforming to size of adjoining field wall tile including existing spaces unless detailed or indicated otherwise in the Finish Schedule on the Drawings.
4. Internal and External Corners:
   a. Square internal and external corner joints are not acceptable.
   b. External Corners Including Edges: Use bullnose shapes.
   c. Internal Corners: Use cove shapes.
   d. Base to Floor Internal Corners: Use special shapes providing integral cove vertical and horizontal joint.
   e. Base to Floor External Corners: Use special shapes providing bullnose vertical edge with integral cove horizontal joint. Use stop at bottom of openings having bullnose return to wall.
   f. Wall Top Edge Internal Corners: Use special shapes providing integral cove vertical joint with bullnose top edge.
   g. Wall Top Edge External Corners: Use special shapes providing bullnose vertical and horizontal joint edge.
   h. For glazed wall tile installed in Portland cement mortar setting bed, use cove and bullnose shapes as applicable.
   i. For glazed wall tile installed in dry-set Portland cement mortar, latex-Portland cement mortar (thin set methods), use cove and surface bullnose shapes as applicable.

2.2 CEMENTITIOUS BACKER UNITS

A. Use in showers or wet areas.
B. ASTM C1325.
C. Use cementitious backer units in maximum available lengths.

2.3 JOINT MATERIALS FOR CEMENTITIOUS BACKER UNITS

A. Reinforcing Tape: Vinyl coated woven glass fiber mesh tape, open weave, 2 inches wide. Tape with pressure-sensitive adhesive backing will not be permitted.
B. Tape Embedding Material: Latex-Portland cement mortar complying with ANSI A108.1.
C. Joint material, including reinforcing tape, and tape embedding material, shall 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 7/16-inch-diameter head, corrosion-resistant coated, with washers.
3. ASTM C954 for steel 0.033-inch thick.
4. ASTM C1002 for steel framing less than 0.0329-inch thick.

B. Washers: Galvanized steel, 1/2-inch minimum diameter.

2.5 GLASS MAT WATER RESISTANT GYPSUM BACKER BOARD

A. Conform to ASTM C1178/C1178M, Optional System for Cementitious Backer Units where shown on Drawings.

2.6 SETTING MATERIALS OR BOND COATS

A. Conform to TCA Handbook for Ceramic Tile Installation.

B. Portland Cement Mortar: ANSI A108.1.

C. Latex-Portland Cement Mortar: ANSI A108.1.

1. For wall applications, provide non-sagging, latex-Portland cement mortar complying with ANSI A108.1.
2. Prepackaged Dry-Mortar Mix: Factory-prepared mixture of Portland cement; dry, redispersible, ethylene vinyl acetate additive; and other ingredients to which only water needs to be added at Project site.

D. Dry-Set Portland Cement Mortar: ANSI A108.1. For wall applications, provide non-sagging, latex-Portland cement mortar complying with ANSI A108.4.

E. Elastomeric Waterproofing Membrane and Bond Coat:

1. TCA F122-02.
2. ANSI A108.1.
3. One-component polyurethane, liquid-applied material having the following additional physical properties:
   a. Hardness: Shore "A" between 40 and60.
   b. Elongation: Between 300 and600 percent.
   c. Tensile strength: Between 40 and 60 psig.
   d. No volatile compounds.
4. Coal tar modified urethanes are not acceptable.

F. Waterproofing Isolation Membrane:

1. Sheet System TCA F122-02.
2. Optional system to elastomeric waterproof membrane.
3. Composite sheet consisting of ASTM D5109, Type II, Grade I Chlorinated Polyethylene (CM) sheet reinforced on both sides with a non-woven polyester fiber.
4. Designed for use in wet areas as an isolation and positive waterproofing membranes for thin-set bonding of sheet to substrate

and thin-set bonding of ceramic and porcelain tile or marble to sheet. Suited for both horizontal and vertical applications.

5. Conform to the following additional physical properties:

Property	Units	Results	Test Method
Hardness Shore A	Points	70-80	ASTM D2240 (10 Second Reading)
Shrinkage	Percent	5 maximum	ASTM D1204
Brittleness		No crack remains flexible at temperature -25 degrees F	ASTM D2497 1/2-inch Mandrel Bend
Retention of Properties after Heat Aging	Percent of original	80 Tensile 80 Breaking 80 Elongation	ASTM D3045, 194 degrees F for 168 hours

6. Manufacturer’s standard sheet size with prefabricated or preformed inside and outside corners.
7. Sheet manufacturer’s solvent welding liquid or xylene and edge sealant.

2.7 GROUTING MATERIALS

A. Coloring Pigments:
   1. Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.
   2. Add coloring pigments to grout by the manufacturer.
   3. Job-colored grout is not acceptable.
   4. Use is required in commercial Portland cement grout, dry-set grout, and latex-Portland cement grout.

B. White Portland Cement Grout:
   1. ANSI A108.1.
   2. Use 1 part white Portland cement to 1 part white sand passing a Number 30 screen.
   3. Color additive not permitted.

C. Commercial Portland Cement Grout: ANSI A108.1 color as specified.

D. Dry-Set Grout: ANSI A108.1 color as specified.

E. Latex-Portland Cement Grout: ANSI A108.1 color as specified.
   1. Unsanded grout mixture for joints 1/8-inch and narrower.
   2. Sanded grout mixture for joints 1/8-inch and wider.

F. Chemical-Resistant Grout: Epoxy grout, ANSI A108.1.

2.8 PATCHING AND LEVELING COMPOUND

A. Portland cement base, polymer-modified, self-leveling compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.

B. Shall have minimum following physical properties:

1. Compressive Strength: 3,500 psig per ASTM C109/C109M.
2. Flexural Strength: 1,000 psig per ASTM C348 (28-day value).
3. Tensile Strength: 600 psi per ANSI 118.7.
4. Density: 1.9.

C. Capable of being applied in layers up to 1-1/2 inches thick without fillers and up to 4 inches thick with fillers, being brought to a feather edge, and being trowelled to a smooth finish.

D. Primers, fillers, and reinforcement as required by manufacturer for application and substrate condition.

E. Ready for use in 48 hours after application.

2.9 WATER

A. Clean, potable and free from salts and other injurious elements to mortar and grout materials.

2.10 CLEANING COMPOUNDS

A. Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.

B. Materials containing acid or caustic material not acceptable.

2.11 FLOOR MORTAR BED REINFORCING

A. ASTM A185 welded wire fabric without backing, MW3 x MW3 (2 x 2-W0.5 x W0.5).

2.12 POLYETHYLENE SHEET

A. Polyethylene sheet conforming to ASTM D4397.

B. Nominal Thickness: 6 mils.

C. Use sheet width to minimize joints.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperature of work areas at not less than 60 degrees F, without interruption, for not less than 24 hours before installation and not less than three 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 100 degrees F.

D. Do not install materials when the temperature of the substrate is below 60 degrees F.
E. Do not allow temperature to fall below 50 degrees F after fourth day of completion of tile work.

3.2 ALLOWABLE TOLERANCE

A. Variation in plane of sub-floor, including concrete fills leveling compounds and mortar beds:
   1. Not more than 1/4-inch in 10 feet from required elevation where Portland cement mortar setting bed is used.
   2. Not more than 1/8-inch in 10 feet where dry-set Portland cement and latex-Portland cement mortar setting beds and chemical-resistant bond coats are used.
B. Variation in Plane of Wall Surfaces:
   1. Not more than 1/4-inch in 8 feet from required plane where Portland cement mortar setting bed is used.
   2. Not more than 1/8-inch in 8 feet where dry-set or latex-Portland cement mortar or organic adhesive setting materials is used.

3.3 SURFACE PREPARATION

A. Cleaning New Concrete or Masonry:
   1. Chip out loose material, clean off all oil, grease, dirt, adhesives, curing compounds, and other deterrents to bonding by mechanical method, or by using products specifically designed for cleaning concrete and masonry.
   2. Use self-contained power blast cleaning systems to remove curing compounds and steel trowel finish from concrete slabs where ceramic tile will be installed directly on concrete surface with thin-set materials.
   3. Steam cleaning or the use of acids and solvents for cleaning will not be permitted.
B. Patching and Leveling:
   1. Mix and apply patching and leveling compound in accordance with manufacturer's instructions.
   2. Fill holes and cracks and align concrete floors that are out of required plane with patching and leveling compound.
      a. Thickness of compound as required to bring finish tile system to elevation shown.
      b. Float finish except finish smooth for elastomeric waterproofing.
      c. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

3. Apply patching and leveling compound to concrete and masonry wall surfaces that are out of required plane.
4. Apply leveling coats of material compatible with wall surface and tile setting material to wall surfaces, other than concrete and masonry that are out of required plane.

C. Mortar Bed for Slopes to Drains:
1. Slope compound to drain where drains are shown.
2. Install mortar bed in depressed slab sloped to drains not less than 1/16-inch per foot.
3. Allow not less than 2-inch depression at edge of depressed slab.
4. Screed for slope to drain and float finish.
5. Cure mortar bed for not less than 7 days. Do not use curing compounds or coatings.

D. Cleavage Membrane:
1. Install polythene sheet as cleavage membrane in depressed slab when waterproof membrane is not scheduled or indicated.
2. Turn up at edge of depressed floor slab to top of floor.

E. Walls:
1. In showers or other wet areas cover studs with polyethylene sheet.
2. Apply patching and leveling compound to concrete and masonry surfaces that are out of required plane.
3. Apply leveling coats of material compatible with wall surface and tile setting material to wall surfaces, other than concrete and masonry that are out of required plane.

F. Existing Floors and Walls:
1. Remove existing composition floor finishes and adhesive. Prepare surface by grinding, chipping, self-contained power blast cleaning or other suitable mechanical methods to completely expose uncontaminated concrete or masonry surfaces. Follow safety requirements of ANSI A10.20.
2. Remove existing concrete fill or topping to structural slab. Clean and level the substrate for new setting bed and waterproof membrane or cleavage membrane.
3. Where new tile bases are required to finish flush with plaster above or where they are extensions of similar bases in conjunction with existing floor tiles, cut channel in floor slab and expose rough wall construction sufficiently to accommodate new tile base and setting material.

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 A108.1 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 8 inches on center and not closer than 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. Where backer unit joins shower pans or waterproofing, lap backer unit over turned up waterproof system. Install fasteners only through top 1 inch of turned up waterproof systems.

F. Do not install joint treatment for 7 days after installation of cementitious backer unit.

G. Joint Treatment:

1. Fill horizontal and vertical joints and corners with latex-Portland cement mortar. Apply fiberglass tape over joints and corners and embed with same mortar.
2. Leave 1/4-inch space for sealant at lips of tubs, sinks, or other plumbing receptors.

3.5 GLASS MAT WATER-RESISTANT GYPSUM BACKER BOARD

A. Install in accordance with manufacturer’s instructions. TCA Systems W245-01.

B. Treat joints with tape and latex-Portland cement mortar or adhesive.

3.6 CERAMIC TILE - GENERAL

A. Comply with ANSI A108 series of tile installation standards in "Specifications for Installation of Ceramic Tile" applicable to methods of installation.

B. Comply with TCA Installation Guidelines:

C. Installing Mortar Beds for Floors:

1. Install mortar bed to not damage cleavage or waterproof membrane; 1-1/2-inch minimum thickness.
2. Install floor mortar bed reinforcing centered in mortar fill.
3. Screed finish to level plane or slope to drains where shown, float finish.

4. For thin set systems cure mortar bed not less than 7 days. Do not use curing compounds or coatings.
5. For tile set with Portland cement paste over plastic mortar bed coordinate to set tile before mortar bed sets.

D. Setting Beds or Bond Coats:
1. Where recessed or depressed floor slabs are filled with Portland cement mortar bed, set ceramic mosaic floor tile in either Portland cement paste over plastic mortar bed or latex-Portland cement mortar over cured mortar bed except as specified otherwise, ANSI A108-1C, TCA System F121-02 or F111-02.
2. Set floor tile in elastomeric bond coat over elastomeric membrane ANSI 108. 13, TCA System F122 where scheduled and where shown.
3. Set wall tile installed over concrete or masonry in dry-set Portland cement mortar, or latex-Portland cement mortar, ANSI 108.1B.and TCA System W211-02, W221-02 or W222-02.
4. Set wall tile installed over concrete backer board in latex-Portland cement mortar, ANSI A108.1B.
5. Set trim shapes in same material specified for setting adjoining tile.

E. 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.
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 loose, cracked or defective tile.
7. Remove and reset tiles that are out of plane or misaligned.

8. Floors:
   a. Extend floor tile beneath casework and equipment, except those units mounted in wall recesses.
   b. Align finish surface of new tile work flush with other and existing adjoining floor finish where shown.
   c. In areas where floor drains occur, slope to drains where shown.
   d. Shove and vibrate tiles over 8 inches square to achieve full support of bond coat.
9. Walls:
   a. Cover walls and partitions, including pilasters, furred areas, and freestanding columns from floor to ceiling, or from floor to nominal wainscot heights shown with tile.
   b. 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.
10. Joints:
   a. Keep all joints in line, straight, level, perpendicular and of even width unless shown otherwise.
   b. Make joints 1/16-inch wide for glazed wall tile and mosaic tile work.
   c. Make joints in paver tile, porcelain type, maximum 1/8-inch wide.
11. 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 series of tile installation standards:
   a. Tile wall installations in wet areas, including showers.
   b. Tile wall installations composed of tiles 8 by 8 inches or larger.
   c. Exterior tile wall installations.

3.7 CERAMIC TILE INSTALLED WITH PORTLAND CEMENT MORTAR

A. Mortar Mixes for Floor, Wall and Base Tile (including Showers): ANSI A108.1 except specified otherwise.
B. Installing Wall and Base Tile: ANSI A108.1, except specified otherwise.
C. Installing Floor Tile: ANSI A108.1, except as specified otherwise. Slope mortar beds to floor drains a minimum of 1/8-inch per foot.

3.8 PORCELAIN TILE INSTALLED WITH LATEX PORTLAND CEMENT BONDING MORTAR

A. Due to the denseness of porcelain tile use latex-Portland cement bonding mortar that meets the requirements of ANSI A108.1. Bonding mortars shall be mixed in accordance with manufacturer’s instructions. Improper liquid ratios and dwell time before placement of bonding mortar and tile shall affect bond.

3.9 THIN-SET CERAMIC AND PORCELAIN TILE INSTALLED WITH DRY-SET PORTLAND CEMENT AND LATEX-PORTLAND CEMENT MORTAR

A. Installation of Tile: ANSI A108.1, except as specified otherwise.

B. Slope tile work to drains not less than 1/8-inch per foot.

3.10 CERAMIC AND PORCELAIN TILE INSTALLED WITH ELASTOMERIC BOND COAT

A. Surface Preparation: Prepare surfaces as specified in paragraph 3.3,G.

B. Installation of Elastomeric Membrane: ANSI A108.1 and TCA F122-02.

1. Prime surfaces, where required, in accordance with manufacturer's instructions.
2. Install first coat of membrane material in accordance with manufacturer's instructions, in thickness of 30 to 50 mils.
3. Extend material over flashing rings of drains and turn up vertical surfaces not less than 4 inches above finish floor surface.
4. When material has set, recoat areas with a second coat of elastomeric membrane material for a total thickness of 50 to 75 mils.
5. After curing test for leaks with 1 inch of water for 24 hours.

C. Installation of Tile in Elastomeric Membrane:

1. Spread no more material than can be covered with tile before material starts to set.
2. Apply tile in second coat of elastomeric membrane material in accordance with the coating manufacturer's instructions in lieu at aggregate surfacing specified in ASTM C1127. Do not install top coat over tile.

3.11 GROUTING

A. Grout Type and Location:

1. Grout for Glazed Wall: Portland cement grout, latex-Portland cement grout, dry-set grout, or commercial Portland cement grout.
2. Grout for Base Tile, Floor Tile, and Paver Tile: Epoxy grout.

B. Workmanship:

1. Install and cure grout in accordance with the applicable standard.
2. Portland Cement Grout: ANSI A108.1.
3. Dry-Set Grout: ANSI A108.1.

3.12 MOVEMENT JOINTS

A. Prepare tile expansion, isolation, construction and contraction joints for installation of sealant. Refer to Section 07 92 00, JOINT SEALANTS.

B. TCA details EJ 171-02.

C. At expansion joints, rake out joint full depth of tile and setting bed and mortar bed. Do not cut waterproof or isolation membrane.

D. Rake out grout at joints between tile, where shown, not less than 1/4-inch deep.

3.13 CLEANING

A. Thoroughly sponge and wash tile. Polish glazed surfaces with clean dry cloths.

B. Methods and materials used shall not damage or impair appearance of tile surfaces.

C. The use of acid or acid cleaners on glazed tile surfaces is prohibited.

D. Clean tile grouted with commercial Portland cement grout and tile set in elastomeric bond coat as recommended by the manufacturer of the grout and bond coat.

3.14 PROTECTION

A. Keep traffic off tile floor, until grout and setting material is firmly set and cured.

B. Where traffic occurs over tile floor, cover tile floor with not less than 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.

3.15 TESTING FINISH FLOOR

A. Test floors in accordance with ASTM C627 to show compliance with Codes 1 through 10.

- - - 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.

1.2 RELATED WORK

A. Color, Pattern, and Location of Each Type of Acoustical Unit: Refer to the Finish Schedule on the Drawings.

B. HVAC: Section 23 37 00, AIR OUTLETS AND INLETS.

C. Lighting: Section 26 51 00, INTERIOR LIGHTING.

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 and upward access system details for concealed grid systems.
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-03.....Zinc-coated (Galvanized) Carbon Steel Wire

A653/A653M-07.....Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-coated (Galvannealed) by the Hot-Dip Process

C423-07.....Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

C634-02 (E2007).....Standard Terminology Relating to Environmental Acoustics
C635-04.....Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
C636-06.....Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
E84-07.....Surface Burning Characteristics of Building Materials
E119-07.....Fire Tests of Building Construction and Materials
E413-04.....Classification for Rating Sound Insulation
E580-06.....Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint
E1264-(R2005).....Classification for Acoustical Ceiling Products

PART 2 - PRODUCTS

2.1 METAL SUSPENSION SYSTEM

A. ASTM C635, 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.
   2. Use same construction for cross runners as main runners. Use of lighter-duty sections for cross runners is not acceptable.
   3. Use aluminum face covers in toilets adjacent to shower areas.
B. Exposed Grid Suspension System for Support of Lay-In Panels:
   1. Exposed grid width not less than 7/8-inch with not less than 5/16-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 indicated otherwise in the Finish Schedule on the Drawings.

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 3/8-inch-wide strip.

2.3 WIRE

A. ASTM A641.

B. For Wire Hangers: Minimum diameter 0.1055-inch.

C. For Bracing Wires: Minimum diameter 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: Fabricate inserts from steel, zinc-coated (galvanized after fabrication).

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.

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 1,000 linear feet:

Size Inches	Cold-rolled Pounds	Hot-rolled Pounds
1-1/2	475	1,120
2	590	1,260

2.6 ACOUSTICAL UNITS

A. General:

1. Ceiling tile shall meet minimum 37 percent bio-based content in accordance with USDA Bio-Preferred Product requirements.
2. ASTM E1264, weighing 3/4-psf minimum for mineral fiber panels or tile.
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): 40 to 44 range unless specified otherwise: ASTM E413.
6. Manufacturer’s standard finish, minimum light reflectance (LR) coefficient of 0.75 on the exposed surfaces, except as indicated in the Finish Schedule on the Drawings.

7. Lay-in Panels: Sizes as shown, with square edges or reveal edges, as applicable per the Finish Schedule on the Drawings.

B. Type III Units: Mineral base with water-based painted finish less than 10 g/l VOC, Form 2 - Water felted, minimum 5/8-inch thick. Mineral base to contain minimum 65 percent recycled content.

C. Type IV Units – Mineral base with membrane-faced overlay, Form 2 – Water felted, minimum 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.

D. Type XII Units: Fiberglass with acoustically transparent membrane, Form Z, Pattern E, Fire Class A, 1-1/2 inches thick with NRC equal to 1.0 and light reflectance of 0.90. Surface finish shall be factory-applied latex paint, color white.

2.7 ACCESS IDENTIFICATION

A. Markers:

1. Use colored markers with pressure-sensitive adhesive on one side.
2. Make colored markers of paper of plastic, 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

3.1 CEILING TREATMENT

A. Treatment of ceilings shall include sides and soffits of ceiling beams, furred work 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.

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, except as specified otherwise.
2. Use direct or indirect hung suspension system or combination thereof as defined in ASTM C635.
3. Support a maximum area of 16 square feet 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 1 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 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 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. 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 4 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 4 feet on center before fireproofing 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.

C. Direct-Hung Suspension System:

1. As illustrated in ASTM C635.
2. Support main runners by hanger wires attached directly to the structure overhead.
3. Maximum spacing of hangers 4 feet on centers unless interference occurs by mechanical systems. Use indirect-hung suspension system where not possible to maintain hanger spacing.

D. Indirect-Hung Suspension System:

1. As illustrated in ASTM C635.
2. Space carrying channels for indirect hung suspension system not more than 4 feet on center. Space hangers for carrying channels not more than 8 feet on center or for carrying channels less than 4 feet or center so as to insure that specified requirements are not exceeded.
3. Support main runners by specially designed clips attached to carrying channels.

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 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.

3.4 CLEANUP AND COMPLETION

A. Replace damaged, discolored, dirty, cracked and broken acoustical units.

B. Leave finished work free from defects.

C. Vacuum tiles prior to final inspection.

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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 and resilient stair treads with sheet rubber flooring on landings.

1.2 RELATED WORK

A. Color and Texture: See the Finish Schedule on the Drawings.

B. 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 material manufacturer's recommendations for adhesives.
3. Application and installation instructions.

C. Samples:

1. Base: 6 inches long, each type and color.
2. Adhesive: Literature indicating each type.

1.4 DELIVERY

A. Deliver materials to the 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 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):
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, 1/8-inch thick, 4 inches high, Thermoplastics, Group 2-layered. Style B-cove.

B. Use only one type of base throughout.

2.3 PRIMER (FOR CONCRETE FLOORS)

A. As recommended by the adhesive and tile manufacturer.

2.4 LEVELING COMPOUND (FOR CONCRETE FLOORS)

A. Provide products with latex or polyvinyl acetate resins in the mix.

2.5 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

3.1 PROJECT CONDITIONS

A. Maintain temperature of materials above 70 degrees F for 48 hours before installation.

B. Maintain temperature of rooms where work occurs, between 70 and 80 degrees 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 Contracting Officer’s Representative (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 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, laboratory, pharmacy furniture island 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.
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 24 inches in 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. Form corners and end stops as follows:

1. Score back of outside corner.
2. Score face of inside corner and notch cove.

D. Roll base for complete adhesion.

3.5 CLEANING AND PROTECTION

A. Clean all exposed surfaces of base and adjoining areas of adhesive spatter before it sets.

B. Keep traffic off resilient material for at least 72 hours after installation.

C. Clean and polish materials in the following order:

1. After 2 weeks, scrub resilient base material 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.

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.

B. Grades of resilient sheet vinyl floor covering without backing having vinyl plastic wearlayer with backing.

C. Installation of sheet flooring including the following:

1. Heat welded seams.

1.2 RELATED WORK

A. Concrete Floors: Section 03 30 00, CAST-IN-PLACE CONCRETE.

B. Color, Pattern and Texture: As shown on the Finish Schedule on the Drawings.

C. Resilient Base: 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 3 installations similar and equivalent in size to this Project for 3 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 (VOCs).

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, 1-1/2 by 12 inches, of each color and pattern with a welded seam using proposed welding rod 12 inches square for each type, pattern and color.
2. 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.
3. Certificates: Quality Control Certificate Submittals and lists specified in paragraph, QUALIFICATIONS.
4. Edge Strips: 6 inches long each type.
5. Adhesive, Underlayment and Primer: Pint container, each type.

1.5 PROJECT CONDITIONS

A. Maintain temperature of floor materials and room, where work occurs, above 65 °F and below 100 °F for 48 hours before, during and for 48 hours after installation. After above period, room temperature shall not fall below 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. Building shall be permanently enclosed. Schedule construction so that floor receives no construction traffic when completed.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in original sealed packages or containers; labeled for identification with manufacturer's name and brand.

B. Deliver sheet flooring 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 the 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

F1303-04(2009).....Sheet Vinyl Floor Covering with Backing

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 plastering, drywall finishing, concrete, terrazzo, 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 2 years.

PART 2 - PRODUCTS

2.1 SHEET VINYL FLOOR COVERINGS

A. Sheet Vinyl Floor Coverings: Embossed face, minimum thickness nominal

2.3 mm. Sheet flooring shall conform to ASTM F1913 and material requirements specified in ASTM F1303, Type II, Grade 1, backing classification not applicable. Foam-backed sheet flooring is not acceptable.

B. Size: Provide maximum size sheet vinyl material produced by manufacturer to provide minimum number of joints. Minimum size width acceptable is 72 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.

2.4 SHEET FLOORING

A. ASTM F1303, Type II, Grade 1, except for backing requirements. Foam backed sheet flooring is not acceptable.

B. Minimum nominal thickness 2.3 mm; 6 feet minimum width.

C. Critical Radiant Flux: 0.45-watts per sq.cm or more, Class I, per ASTM E648.

D. Smoke Density: Less than 450 per ASTM E662.

E. Color and pattern of sheet flooring of the same production run.

2.5 ADHESIVES

A. Water-resistant type recommended by the sheet flooring manufacturer for the conditions of use. VOC not to exceed 50g/L

2.6 LEVELING COMPOUND (FOR CONCRETE FLOORS)

A. Provide cementitious products with latex or polyvinyl acetate resins in the mix.

2.7 PRIMER (FOR CONCRETE SUBFLOORS)

A. As recommended by the adhesive or sheet flooring manufacturer.

2.8 EDGE STRIPS

A. As specified in Section 09 65 13, RESILIENT BASE AND ACCESSORIES.

2.9 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 65 °F for 48 hours before installation.

B. Maintain temperature of rooms where sheet flooring work occurs above 65 °F for 48 hours, before installation and during installation.

C. After installation, maintain temperature at or above 65 °F.

D. Building is permanently enclosed.

E. 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 are to 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 3 lbs of water per 1,000 sq. ft. in 24 hours.
2. Perform concrete internal relative humidity testing using 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. Coordinate with Asbestos Abatement Section if asbestos abatement procedures will be involved.

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 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 Contracting Officer’s Representative (COR) 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 center lines of doors unless otherwise indicated.
   2. Set resilient strips in adhesive per manufacturer’s installation instructions.
M. Base Installation: As specified in Section 09 65 13, RESILIENT BASE AND ACCESSORIES.

3.4 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.

3.5 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 sheet flooring 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, COR shall 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.

3.6 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, and re-clean sheet flooring.

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SECTION 09 91 00
PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section specifies field painting.

B. Section specifies prime coats which may be applied in shop under other sections.

C. Painting includes shellacs, stains, varnishes, coatings specified, and striping or markers and identity markings.

1.2 RELATED WORK

A. Type of Finish, Color, and Gloss Level of Finish Coat: As indicated in the Finish Schedule on the Drawings.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data: Before work is started or sample panels are prepared, submit manufacturer's literature, 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 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.

C. 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, 4 inches by 10 inches by 1/8-inch.
3. Panel to Show Transparent Finishes: Wood of same species and grain pattern as wood approved for use, 4-inch by 10-inch face by 1/4-inch-thick minimum, and where both flat and edge grain will be exposed, 10 inches long by sufficient size, 2 by 2 inches minimum or actual wood member to show complete finish.
4. Attach Labels to Panel Stating the Following:
   a. Federal Specification Number or manufacturer’s name and product number of paints used.
   b. Product type and color.

c. Name of Project.

5. Strips showing not less than 2-inch-wide strips of undercoats and 4-inch-wide strip of finish coat.

D. Sample of identity markers if used.

E. Manufacturers' Certificates indicating compliance with specified requirements:

1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.
2. Epoxy coating.

1.4 DELIVERY AND STORAGE

A. Deliver materials to 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. If paint or other coating, state coat types; prime, body or finish.

C. Maintain space for storage, and handling of painting materials and equipment in a neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.

D. Store materials at site at least 24 hours before using, at a temperature between 65 and 85 degrees F.

1.5 MOCK-UP PANEL

A. Before starting application of water paint mixtures, apply paint as specified to an area, not to exceed 100 square feet, selected by Contracting Officer’s Representative (COR).

B. Finish and texture approved by COR will be used as a standard of quality for remainder of work.

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 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. American National Standards Institute (ANSI):

A13.1-07.....Scheme for the Identification of Piping Systems

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

D260-86.....Boiled Linseed Oil

E. Commercial Item Description (CID):

A-A-1555.....Water Paint, Powder (Cementitious, White and Colors) (WPC) (cancelled)

A-A-3120.....Paint, For Swimming Pools (RF) (cancelled)

F. Federal Specifications (Fed Spec):

TT-P-1411A.....Paint, Copolymer-Resin, Cementitious (For Waterproofing Concrete and Masonry Walls) (CEP)

G. Master Painters Institute (MPI):

No. 1-12.....Aluminum Paint (AP)

No. 4-12.....Interior/Exterior Latex Block Filler

No. 5-12.....Exterior Alkyd Wood Primer

No. 7-12.....Exterior Oil Wood Primer

No. 8-12.....Exterior Alkyd, Flat MPI Gloss Level 1 (EO)

No. 9-12.....Exterior Alkyd Enamel MPI Gloss Level 6 (EO)

No. 10-12.....Exterior Latex, Flat (AE)

No. 11-12.....Exterior Latex, Semi-Gloss (AE)

No. 18-12.....Organic Zinc Rich Primer

No. 22-12.....Aluminum Paint, High Heat (up to 590% - 1,100 F) (HR)

No. 26-12.....Cementitious Galvanized Metal Primer

No. 27-12.....Exterior/Interior Alkyd Floor Enamel, Gloss (FE)

No. 31-12.....Polyurethane, Moisture Cured, Clear Gloss (PV)

No. 36-12.....Knot Sealer

No. 43-12.....Interior Satin Latex, MPI Gloss Level 4

No. 44-12.....Interior Low Sheen Latex, MPI Gloss Level 2

No. 45-12.....Interior Primer Sealer

No. 46-12.....Interior Enamel Undercoat

No. 47-12.....Interior Alkyd, Semi-Gloss, MPI Gloss Level 5 (AK)

No. 48-12.....Interior Alkyd, Gloss, MPI Gloss Level 6 (AK)

No. 49-12.....Interior Alkyd, Flat, MPI Gloss Level 1 (AK)

No. 50-12.....Interior Latex Primer Sealer

No. 51-12.....Interior Alkyd, Eggshell, MPI Gloss Level 3

No. 52-12.....Interior Latex, MPI Gloss Level 3 (LE)

No. 53-12.....Interior Latex, Flat, MPI Gloss Level 1 (LE)

No. 54-12.....Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE)
No. 59-12.....Interior/Exterior Alkyd Porch & Floor Enamel, Low Gloss (FE)
No. 60-12.....Interior/Exterior Latex Porch & Floor Paint, Low Gloss
No. 66-12.....Interior Alkyd Fire Retardant, Clear Top Coat (ULC Approved) (FC)
No. 67-12.....Interior Latex Fire Retardant, Top Coat (ULC Approved) (FR)
No. 68-12.....Interior/Exterior Latex Porch & Floor Paint, Gloss
No. 71-12.....Polyurethane, Moisture Cured, Clear, Flat (PV)
No. 74-12.....Interior Alkyd Varnish, Semi-Gloss
No. 77-12.....Epoxy Cold Cured, Gloss (EC)
No. 79-12.....Marine Alkyd Metal Primer
No. 90-12.....Interior Wood Stain, Semi-Transparent (WS)
No. 91-12.....Wood Filler Paste
No. 94-12.....Exterior Alkyd, Semi-Gloss (EO)
No. 95-12.....Fast Drying Metal Primer
No. 98-12.....High Build Epoxy Coating
No. 101-12.....Epoxy Anti-Corrosive Metal Primer
No. 108-12.....High Build Epoxy Coating, Low Gloss (EC)
No. 114-12.....Interior Latex, Gloss (LE) and (LG)
No. 119-12.....Exterior Latex, High Gloss (acrylic) (AE)
No. 135-12.....Non-Cementitious Galvanized Primer
No. 138-12.....Interior High Performance Latex, MPI Gloss Level 2 (LF)
No. 139-12.....Interior High Performance Latex, MPI Gloss Level 3 (LL)
No. 140-12.....Interior High Performance Latex, MPI Gloss Level 4
No. 141-12.....Interior High Performance Latex (SG) MPI Gloss Level 5

H. Steel Structures Painting Council (SSPC):
SSPC SP 1-04 (R2004)....Solvent Cleaning
SSPC SP 2-04 (R2004)....Hand Tool Cleaning
SSPC SP 3-04 (R2004)....Power Tool Cleaning

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide products by Sherwin-Williams: Paint Stores Group, or approved equal.

2.2 MATERIALS

A. Interior/Exterior Latex Block Filler: MPI 4.

B. Exterior Latex, Semi-Gloss (AE): MPI 11.

C. Knot Sealer: MPI 36.

D. Interior Satin Latex: MPI 43.

E. Interior Primer Sealer: MPI 45.

F. Interior Enamel Undercoat: MPI 47.

G. Interior Alkyd, Semi-Gloss (AK): MPI 47.

H. Interior Latex Primer Sealer: MPI 50.

I. Interior Alkyd, Eggshell: MPI 51

J. Interior Latex, MPI Gloss Level 3 (LE): MPI 52.

K. Interior Latex, Flat, MPI Gloss Level 1 (LE): MPI 53.

L. Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE): MPI 54.

M. Epoxy Cold-Cured, Gloss (EC): MPI 77.

N. Interior Wood Stain, Semi-Transparent (WS): MPI 90.

O. Wood Filler Paste: MPI 91.

P. High-Build Epoxy Coating: MPI 98.

2.3 PAINT PROPERTIES

A. Use ready-mixed (including colors), except 2-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.

2.4 REGULATORY REQUIREMENTS/QUALITY ASSURANCE

A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.

1. Volatile Organic Compounds (VOC): VOC content of paint materials shall not exceed 10 g/l for interior latex paints/primers and 50 g/l for exterior latex paints and primers.

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.

3. Asbestos: Materials shall not contain asbestos.
4. Chromate, Cadmium, Mercury, and Silica: Materials shall not contain zinc-chromate, strontium-chromate, cadmium, mercury or mercury compounds or free crystalline silica.
5. Human Carcinogens: Materials shall 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, where possible.
7. VOC content for solvent-based paints shall not exceed 250 g/l and shall not be formulated with more than 1 percent aromatic hydrocarbons by weight.

PART 3 - EXECUTION

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 the site at end of each days work.

B. Atmospheric and Surface Conditions:
   1. Do not apply coating when air or substrate conditions are:
      a. Less than 5 degrees F above dew point.
      b. Below 50 degrees F or over 95 degrees F, unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.
   2. Maintain interior temperatures until paint dries hard.
   3. 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 where allowed by manufacturer's printed instructions.

3.2 SURFACE PREPARATION

A. Method of surface preparation is optional, provided results of finish painting produce solid even color and texture specified with no overlays.

B. General:
   1. Remove prefinished items not to be painted such as lighting fixtures, escutcheon plates, hardware, trim, and similar items for reinstallation after paint is dried.
   2. Remove items for reinstallation and complete painting of such items and adjacent areas when item or adjacent surface is not accessible or finish is different.
   3. See other Sections of Specifications for specified surface conditions and prime coat.
   4. Clean surfaces for painting with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used. Do not use solvents, acid, or steam on concrete and masonry.
C. 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.
D. 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). Exception: Where high-temperature aluminum

paint is used, prepare surface in accordance with paint manufacturer's instructions.

3. Fill dents, holes and similar voids and depressions in flat exposed surfaces of hollow steel doors and frames, access panels, roll-up steel doors 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. This includes 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 prime 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.

E. Zinc-Coated (Galvanized) Metal, 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.

F. Masonry, Concrete, Cement Board, Cement Plaster and Stucco:
1. Clean and remove dust, dirt, oil, grease efflorescence, form release agents, laitance, and other deterrents to paint adhesion.
2. Use emulsion type cleaning agents to remove oil, grease, paint and similar products. Use of solvents, acid, or steam is not permitted.
3. Remove loose mortar in masonry work.
4. Replace mortar and fill open joints, holes, cracks and depressions with new mortar. Do not fill weep holes. Finish to match adjacent surfaces.
5. Repair broken and spalled concrete edges with concrete patching compound to match adjacent surfaces as specified in CONCRETE Sections. Remove projections to level of adjacent surface by grinding or similar methods.

G. Gypsum Plaster and Gypsum Board:
1. Remove efflorescence, loose and 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 [Plaster, Gypsum (Spackling Compound) finished flush with adjacent surface, with texture to match texture of adjacent surface. Patch holes over 1 inch in diameter as specified in Section for plaster or gypsum board.

3.3 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 2-component and 2-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.

3.4 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 3 coats; prime, body, and finish. When 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. Finish surfaces to show solid even color, free from runs, lumps, brushmarks, laps, holidays, or other defects.
F. Apply by brush, roller or spray, except as otherwise specified.
G. Do not spray paint in existing occupied spaces unless approved by COR, except in spaces sealed from existing occupied spaces.
   1. Apply painting materials specifically required by manufacturer to be applied by spraying.
   2. In areas 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 WORK NOT PAINTED, motors, controls, telephone, and electrical equipment, fronts of sterilizers and other recessed equipment and similar prefinished items.

H. Do not paint in closed position operable items such as access doors and panels, window sashes, overhead doors, and similar items except overhead roll-up doors and shutters.

3.5 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 except for exterior exposed steel apply an additional prime coat.

D. Prime rebates for stop and face glazing of wood, and for face glazing of steel.

E. Wood:

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.

F. Metals Except Boilers, Incinerator Stacks, and Engine Exhaust Pipes:

1. Steel and Iron: MPI 95 (Fast Drying Metal Primer).
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 (EO)).
5. Asphalt-Coated Metal: MPI 1 (Aluminum Paint (AP)).

G. Gypsum Board:

1. Surfaces scheduled to have MPI 140 (High-Performance Interior Latex, MPI Gloss Level 4).
2. Primer: MPI 50(Interior Latex Primer Sealer) except use MPI 45 (Interior Primer Sealer) in shower and bathrooms.
3. Surfaces Scheduled to Receive Vinyl-Coated Fabric Wallcovering: Use MPI 45 (Interior Primer Sealer).
4. Use MPI 101 (cold-curing epoxy primer) for surfaces scheduled to receive MPI 77 (epoxy cold-cured, gloss (EC)), or MPI 98 (high-build epoxy coating).

H. Concrete Masonry Units Except Glazed or Integrally Colored and Decorative Units: MPI 4 (Block Filler) on interior surfaces.

I. Interior Surfaces of Ceiling and Walls:

1. MPI 53 (interior latex, flat, MPI Gloss Level 1 (LE)), or MPI 52 (Interior Latex, MPI Gloss Level 3 (LE)), or MPI 54 (Interior Latex,

Semi-Gloss, MPI Gloss Level 5 (LE)), as indicated in the Finish Schedule on the Drawings.

2. Use MPI 77 (Epoxy Cold-Cured, Gloss (EC)), or MPI 98 (High-Build Epoxy Coating) as indicated in the Finish Schedule on the Drawings.

3.6 EXTERIOR FINISHES

A. Apply following finish coats where indicated in the Finish Schedule on the Drawings.

B. Wood:

1. Do not apply finish coats on surfaces concealed after installation, top and bottom edges of wood doors.
2. Two coats of MPI 11 (Exterior Latex, Semi-Gloss (AE)) on exposed surfaces, except where transparent finish is specified.
3. Two coats of MPI 71 (Polyurethane, Moisture Cured, Clear Flat (PV)) for transparent finish.

C. Steel and Ferrous Metal: Two coats of MPI 94 (Exterior Alkyd, Semi-Gloss (EO)) on exposed surfaces, except on surfaces over 200 degrees F.

3.7 INTERIOR FINISHES

A. Apply following finish coats over prime coats in spaces or on surfaces as indicated in the Finish Schedule on the Drawings.

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. Apply 2 coats of MPI 47 (Interior Alkyd, Semi-Gloss (AK)) unless specified otherwise.
   b. Two coats of MPI 51 (Interior Alkyd, Eggshell (AK)).
   c. Ferrous Metal over 200 degrees F: Boilers, Incinerator Stacks, and Engine Exhaust Pipes: One coat MPI 22 (High-Heat-Resistant Coating (HR)).

C. Gypsum Board:

1. One coat of MPI 45 (Interior Primer Sealer) plus 2 coats of MPI 140 (Interior High-Performance Latex, MPI Gloss Level 4).
2. One coat of MPI 101 (Cold-Curing Epoxy Primer) plus 2 coats of MPI 77 (Epoxy Cold-Cured, Gloss (EC)).

D. Plaster: One coat of MPI 50 (Interior Latex Primer Sealer) plus 2 coats of MPI 140 (Interior High-Performance Latex, MPI Gloss Level 4).

E. Masonry and Concrete Walls:

1. Over MPI 4 (Interior/Exterior Latex Block Filler) on CMU surfaces.
2. Two coats of MPI 140 (Interior High-Performance Latex MPI Gloss level 4).

F. 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. Apply sealers specified except sealer may be omitted where pigmented, penetrating, or wiping stains containing resins are used.
      b. Allow manufacturer's recommended drying time before sanding, but not less than 24 hours or 36 hours in damp or muggy weather.
      c. Sand as specified.
   3. Paint Finish: One coat of MPI 45 (Interior Primer Sealer) plus 2 coats of MPI 47 (Interior Alkyd, Semi-Gloss (AK)) (SG).
   4. Transparent Finishes on Wood Except Floors:
      a. Stain Finish:
         1) One coat of MPI 90 (Interior Wood Stain, Semi-Transparent (WS)).
         2) Use wood stain of type and color required to achieve finish specified. Do not use varnish type stains.
         3) One coat of sealer as written in 2.1 E.
         4) Two coats of MPI 31 (Polyurethane Moisture Cured, Clear Gloss (PV)).

3.8 REFINISHING EXISTING PAINTED SURFACES

A. Clean, patch and repair existing surfaces as specified under surface preparation.
B. Remove and reinstall items as specified under surface preparation.
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 coat of MPI 31 (Polyurethane, Moisture Cured, Clear Gloss).

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.

3.9 PAINT COLOR

A. Color and gloss of finish coats is indicated in the Finish Schedule on the Drawings.
B. For additional requirements regarding color, see Articles REFINISHING EXISTING PAINTED SURFACE and MECHANICAL AND ELECTRICAL FIELD PAINTING SCHEDULE.
C. 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 shall not show through the finish coat and shall mask surface imperfections or contrasts.
D. Painting, Caulking, Closures, and Fillers Adjacent to Casework: Paint to match color of wall.

3.10 MECHANICAL AND ELECTRICAL WORK FIELD PAINTING SCHEDULE

A. Field painting of mechanical and electrical consists of cleaning; touching up abraded shop prime 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 under paragraph H, Colors.
C. Paint various systems specified in Division 02 – EXISTING CONDITIONS, 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 in interstitial spaces, above suspended ceilings, in concealed areas such as pipe and electric closets, pipe basements, pipe tunnels, trenches, attics, roof spaces, shafts and furred spaces except on electrical conduit containing feeders 600 volts or more.
G. Omit field painting of items specified in paragraph, Building and Structural WORK NOT PAINTED.

H. Color: Paint items having no color specified in Finish Schedule on the Drawings to match surrounding surfaces.

I. Apply paint systems on properly prepared and primed surface as follows:

1. Exterior Locations:

a. Apply 2 coats of MPI 94 (Exterior Alkyd, Semi-gloss (EO)) to the following ferrous metal items: Vent and exhaust pipes with temperatures under 200 degrees F, roof drains, fire hydrants, post indicators, yard hydrants, exposed piping and similar items.

b. Apply 2 coats of MPI 11 (Exterior Latex, Semi Gloss (AE)) to the following metal items: Galvanized and zinc-copper alloy metal.

2. Interior Locations:

a. Apply 2 coats of MPI 47 (Interior Alkyd, Semi-Gloss (AK)) to following items:

1) Metal less than 200 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 prime coat and not factory finished.

b. Paint electrical conduits containing cables rated 600 volts or more using 2 coats of MPI 94 (Exterior Alkyd, Semi-gloss (EO)) in the Federal Safety Orange color in exposed and concealed spaces full length of conduit.

3. Other Exposed Locations: Cloth jackets of insulation of ducts and pipes in connection with plumbing, air conditioning, ventilating refrigeration and heating systems: One coat of MPI 50 (Interior Latex Primer Sealer) and 1 coat of MPI 11 (Exterior Latex Semi-Gloss (AE)).

3.11 BUILDING AND STRUCTURAL WORK FIELD PAINTING

A. Painting and finishing of interior and exterior work except as specified under paragraph 3.11,B.

1. Painting and finishing of new and existing work including colors and gloss of finish selected is specified in Finish Schedule on the Drawings.

2. Painting of disturbed, damaged and repaired or patched surfaces when entire space is not scheduled for complete repainting or refinishing.

3. Identity painting and safety painting.

B. Building and Structural Work Not Painted:

1. Prefinished Items:

a. Casework, doors, metal panels, wallcovering, and similar items specified 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. Inside shafts, interstitial spaces, pipe basements, crawl spaces, pipe tunnels, above ceilings, attics, except as otherwise specified.
   b. Inside walls or other spaces behind access doors or panels.
   c. Surfaces concealed behind permanently installed casework and equipment.
4. Moving and Operating Parts:
   a. Shafts, chains, gears, mechanical and electrical operators, linkages, and sprinkler heads, and sensing devices.
   b. Tracks for overhead or coiling doors, shutters, and grilles.
5. Labels:
   a. Code required label, such as Underwriters Laboratories Inc., Inchcape Testing Services, Inc., or Factory Mutual Research Corporation.
   b. Identification plates, instruction plates, performance rating, and nomenclature.
6. Ceilings, walls, columns in interstitial spaces.

3.12 IDENTITY PAINTING SCHEDULE

A. Identify designated service in accordance with ANSI A13.1, unless specified otherwise, on exposed piping, piping above removable ceilings, piping in accessible pipe spaces, interstitial spaces, and piping behind access panels.
   1. Legend may be identified using 2.1,G. options or by 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 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.
   5. Identify pipe contents with sufficient additional details such as temperature, pressure, and contents to identify possible hazard. Insert working pressure shown on Drawings where asterisk appears for High, Medium, and Low Pressure designations as follows:

a. High Pressure - 60 psig and above.
b. Medium Pressure - 15 to 59 psig.
c. Low Pressure - 14 psig and below.
d. Add fuel oil grade numbers.

6. Legend name in full or in abbreviated form as follows:

PIPING	COLOR OF EXPOSED PIPING	COLOR OF BACKGROUND	COLOR OF LETTERS	LEGEND ABBREVIATIONS
Blow-off		Yellow	Black	Blow-off
Boiler Feedwater		Yellow	Black	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		Yellow	Black	Shop Air
Air-Instrument Controls		Green	White	Air-Inst Cont
Drain Line		Green	White	Drain
Emergency Shower		Green	White	Emg Shower
High-Pressure Steam		Yellow	Black	H.P._____*
High-Pressure Condensate Return		Yellow	Black	H.P. Ret_____*
Medium-Pressure Steam		Yellow	Black	M.P. Stm_____*
Medium-Pressure Condensate Return		Yellow	Black	M.P. Ret_____*
Low-Pressure Steam		Yellow	Black	L.P. Stm_____*
Low-Pressure Condensate Return		Yellow	Black	L.P. Ret_____*
High-Temperature Water Supply		Yellow	Black	H. Temp Wtr Sup
High-Temperature Water Return		Yellow	Black	H. Temp Wtr Ret
Hot Water Heating Supply		Yellow	Black	H. W. Htg Sup
Hot Water Heating Return		Yellow	Black	H. W. Htg Ret
Gravity Condensate Return		Yellow	Black	Gravity Cond Ret
Pumped Condensate Return		Yellow	Black	Pumped Cond Ret
Vacuum Condensate Return		Yellow	Black	Vac Cond Ret
Fuel Oil - Grade		Brown	White	Fuel Oil-Grade *
(Diesel Fuel included under Fuel Oil)				
Boiler Water Sampling		Yellow	Black	Sample
Chemical Feed		Yellow	Black	Chem Feed
Continuous Blow-Down		Yellow	Black	Cont. B D
Pumped Condensate		Black		Pump Cond
Pump Recirculating		Yellow	Black	Pump-Recirc.
Vent Line		Yellow	Black	Vent
Alkali		Yellow	Black	Alk

Bleach		Yellow	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		Yellow	Black	Acid Waste
Vent		Yellow	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

Hot Water Supply Domestic/Solar Water H.W. Sup Dom/SW
Hot Water Return Domestic/Solar Water H.W. Ret Dom/SW

7. Electrical conduits containing feeders over 600 volts, paint legends using 2-inch-high black numbers and letters, showing the voltage class rating. Provide legends where conduits pass through walls and floors and at maximum 20-foot intervals in between. Use labels with yellow background with black border and words Danger High Voltage Class.

B. Fire and Smoke Partitions:

1. Identify partitions above ceilings on both sides of partitions except within shafts in letters not less than 2-1/2 inches high.

2. Stenciled Message: "SMOKE BARRIER" or "FIRE BARRIER" as applicable.
3. Locate not more than 20 feet on center on corridor sides of partitions, and with a least one message per room on room side of partition.
4. Use semigloss paint of color that contrasts with color of substrate.

3.13 PROTECTION, CLEANUP, AND TOUCHUP

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 of paint drops or smears.

C. Before final inspection, touch up or refinished 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 11 13
MARKER BOARDS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies marker boards and related items. Refer to Drawings for additional information and requirements regarding the marker boards and accessories.

B. Boards may be either factory or field assembled.

C. Where shown, assemble marker boards with tackboards into a single unit.

1.2 RELATED WORK

A. Color of aluminum anodic coating and marker board writing surface: As shown in Finish Schedule on the Drawings.

1.3 QUALITY ASSURANCE

A. Boards shall be the products of one manufacturer.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Shop Drawings: Identifying all parts by name and material and showing design, construction, installation, anchorage and relation to adjacent construction.

C. Manufacturer's Literature and Data: Marker boards.

D. Samples:

1. Marker board writing surface, 6 by 6 inches, each color, mounted on backing.
2. Integrally colored anodized aluminum, 6-inch length.
3. Each accessory (after approval, may be used in the work).

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 National Standards (ANSI):

Z97.1-09.....Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test

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

B221/B221M-08.....Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes and Tubes

C1036-06.....Flat Glass

C1048-04.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass

F104-03(R2009).....Nonmetallic Gasket Materials

D. Composite Panel Association (CPA):

A208.1-09.....Particleboard

A135.4-04.....Basic Hardboard

E. Porcelain Enamel Institute (PEI)

1001-11.....Architectural Porcelain Enamel

PART 2 - PRODUCTS

2.1 MARKER BOARD

A. Marker boards shall consist of a writing surface, snap on aluminum frame, marker trough, mullions, display rail and accessories, grounds and other items specified and shown.

2.2 FABRICATION

A. Materials:

1. Aluminum, Extruded: ASTM B221.
2. Backing: Hardboard, AHBA A135.4 or particleboard, CPA A208.1.

B. Components:

1. Writing Surface: Factory assembly consisting of face sheet of 24-gage sheet steel with porcelain enamel board texture finish conforming to PEI 1001, laminated to a hardboard or particleboard backing, 3/8- to 1/2-inch) thick, and a 0.005-inch-thick aluminum foil back sheet laminated to back-face.
2. Frames (Trim): Extruded aluminum, 0.060-inch thick, snap-on type, approximate face width 1-3/4 inches, depth and configuration as required to return to wall and engage clips.
3. Trough: Extruded aluminum, 0.092-inch thick, not less than 3-inch projection from writing surface with grooved top surface, closed ends and return to wall surface at underside. Design to be snap-on type with concealed fasteners.
4. Accessories: Fabricate from aluminum with holders from spring steel. Design to suit display rail. Furnish accessories as follows:

Accessory Type	Lineal feet of rail per accessory
Paper holder	Full length of marker board
Map hook	Full length of marker board

5. Mullions: Snap-on type, same material and face width as frames, designed to finish flush with frame.

6. Grounds: Continuous zinc-coated (galvanized) steel or extruded aluminum members designed to support the board writing surface and clips for snap-on frames, map rail and chalk tray.
7. Clips: Manufacturer's standard as required to support frame, mullions, display rail, and trough.

C. Boards 12 feet or less in length shall be in one piece. Larger units shall have one joint at center. Joints shall have metal spline, with faces in same plane and edges shall touch along entire length.

D. Finish exposed aluminum surfaces as follows: AA 45 chemically etched medium matte, with clear anodic coating Class II Architectural, 0.4 mils thick (AA-M12C22A32).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Install units in accordance with the manufacturer's installation instructions, use concealed fasteners.

B. Inspect surfaces and related construction to receive units. Partitions shall have reinforcing to receive fasteners. Verify type and placement of reinforcement.

C. Do not proceed with the installation until reinforcement is in place and surfaces are flat.

D. Assemble units as specified by the manufacturer.

3.2 INSTALLATION OF MARKER BOARD

A. Mount board with adhesive and blocking pads spaced 16 inches on center each way.

B. Grounds designed to receive clips for snap-on trim shall be continuous and be secured 12 inches on center. Space clips 12 inches on center.

C. Miter trim at corners, conceal fasteners. Modify trim as required to conform to surrounding construction details.

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SECTION 10 11 23
TACKBOARDS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies tackboards (bulletin boards) and glass door bulletin boards and related items. Refer to the Drawings for additional information and requirements regarding the tackboards, bulletin boards, and accessories.
B. Boards may be either factory or field assembled.
C. Where shown, assemble both marker boards and tackboards into a single unit.

1.2 RELATED WORK

A. Color of Aluminum Anodic Coating Tackboard: As indicated in Finish Schedule on the Drawings.

1.3 QUALITY ASSURANCE

A. Boards shall be the products of one manufacturer.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
B. Shop Drawings: Identifying all parts by name and material and showing design, construction, installation, anchorage and relation to adjacent construction.
C. Manufacturer's Literature and Data:
   1. Bulletin board.
   2. Glass door bulletin board.
D. Samples:
   1. Tackboard, 6 by 6 inches, each color, mounted on backing.
   2. Cork filled map rail, 6-inch length.
   3. Each accessory (after approval, may be used in the work).

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. National Association of Architectural Metal Manufacturers (NAAMM):
   AMP 500 Series.....Metal Finishes Manual
   AMP 501.....Finishes for Aluminum
C. American National Standards Institute(ANSI):
   Z97.1-09.....Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test

D. American Society for Testing and Materials (ASTM):
B221/B221M-08.....Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Shapes and Tubes
C1036-06.....Flat Glass
C1048-04.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass
F104-03(R2009).....Nonmetallic Gasket Materials
E. Composite Panel Association (CPA):
A208.1-09.....Particleboard
A135.4-04.....Basic Hardboard

PART 2 - PRODUCTS

2.1 BULLETIN BOARD

A. Bulletin board shall consist of a tackboard, snap-on aluminum frame, grounds and other items specified and shown.

2.2 GLASS DOOR BULLETIN BOARD

A. Glass door bulletin board shall consist of a tackboard, aluminum tubular frame, sliding aluminum framed glazed doors and other items specified and shown.

2.3 FABRICATION

A. Materials:
1. Aluminum, Extruded: ASTM B221.
2. Cork: ASTM F104, Type II, mildew resistant, Class 2.
3. Glass: ASTM C1036, Clear, Class 1, Quality q3, 1/4-inch thick.
4. Tempered Glass: ASTM C1048, Clear Kind FT, Condition A, Type I, Class 1, Quality q3, 1/4-inch thick. Safety glass, ANSI Z97.1, labeled.
5. Backing: Hardboard, AHBA A135.4 or particleboard, CPA A208.1.

B. Components:
1. Tackboard: Cork face, 1/4-inch thick, factory laminated to a hardboard or particleboard backing of thickness required so that the face of the cork will be in the same plane as the face of the marker board writing surface, 1/4- to 3/8-inch thick.
2. Frames (Trim): Extruded aluminum, 0.060-inch thick, snap-on type, approximate face width 1-3/4 inches, depth and configuration as required to return to wall and engage clips.
3. Display Rail: Snap-on type, same materials as frames, approximate face width 1 inch with 1/4-inch-thick cork insert.
4. Mullions: Snap-on type, same material and face width as frames, designed to finish flush with frame.
5. Grounds: Continuous zinc-coated (galvanized) steel or extruded aluminum members designed to support the tackboard and clips for snap-on frames, and map rail

6. Clips: Manufacturer's standard as required to support frame, mullions, and display rail,
7. Tubular Frame (For Glass Door Bulletin Board): Extruded aluminum, 0.092-inch thick; tubular or open back in section, with flanges for concealed attachment, designed to support door hardware and tackboard.

C. Bulletin boards 12 feet or less in length shall be in 1 piece. Larger units shall have 1 joint at center. Joints shall have metal spline, with faces in same plane and edges shall touch along entire length.
D. Finish Exposed Aluminum Surfaces as Follows: AA 45 chemically etched medium matte, with clear anodic coating Class II Architectural, 0.4 mils thick (AA-M12C22A32).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Install units in accordance with the manufacturer's installation instructions, use concealed fasteners.
B. Inspect surfaces and related construction to receive units. Partitions shall have reinforcing to receive fasteners. Verify type and placement of reinforcement.
C. Do not proceed with the installation until reinforcement is in place and surfaces are flat.
D. Assemble units as specified by the manufacturer.

3.2 INSTALLATION OF BULLETIN BOARD (EXCEPT GLASS DOOR BULLETIN BOARDS)

A. Mount bulletin boards with adhesive and blocking pads spaced 16 inches on center each way.
B. Grounds designed to receive clips for snap-on trim shall be continuous and be secured 12 inches on center. Space clips 12 inches on center.
C. Miter trim at corners, conceal fasteners. Modify trim as required to conform to surrounding construction details.

3.3 INSTALLATION OF GLASS DOOR BULLETIN BOARDS

A. Glass door bulletin board units shall be factory assembled, except tackboard may be either field mounted or shop mounted on frame.
B. Mounting bolts or screws shall be oval head of stainless steel or chromium-plated steel or brass. Space fasteners 20 inches on center, except not less than 3 fasteners each side, top and bottom. Heads of fasteners shall not show on the frame face.

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SECTION 10 26 00
WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies wall guards (crash rails or bumper guards), handrails, chair rails, corner guards, and high-impact wallcovering.

1.2 RELATED WORK

A. Armor Plates and Kick Plates Not Specified in This Section: Section 08 71 00, DOOR HARDWARE.

B. Color and Texture of Aluminum and Resilient Material: As indicated in the Finish Schedule on the Drawings.

1.3 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. Handrails.
2. Chair rails.
3. Wall guards (crash rails).
4. Corner guards.
5. High-impact wallcovering.

D. Test Report: Showing that resilient material complies with specified fire and safety code requirements.

1.4 DELIVERY AND STORAGE

A. Deliver materials to the 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 70 degrees F for at least 48 hours prior to installation.

1.5 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 and Materials (ASTM):

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

B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

D256-06.....Impact Resistance of Plastics
D635-06.....Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
E84-09.....Surface Burning Characteristics of Building Materials

C. The National Association of Architectural Metal Manufacturers (NAAMM):
AMP 500-06.....Metal Finishes Manual

D. National Fire Protection Association (NFPA):
80-10.....Standard for Fire Doors and Windows

E. Society of American Automotive Engineers (SAE):
J 1545-05.....Instrumental Color Difference Measurement for Exterior Finishes.

F. Underwriters Laboratories Inc. (UL):
Annual Issue.....Building Materials Directory

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A167, Type 302B.

B. Aluminum Extruded: ASTM B221, Alloy 6063, Temper T5 or T6. Aluminum alloy used for colored anodizing coating shall be as required to produce specified color.

C. Resilient Material:

1. Extruded and injection-molded acrylic vinyl or extruded polyvinyl chloride meeting following requirements:
   a. Minimum impact resistance of 25 ft. lbs. per sq. ft. when tested in accordance with ASTM D256 (Izod impact, ft. lbs. per inch notch).
   b. Class 1 fire 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. Material shall be labeled and tested by Underwriters Laboratories or other approved independent testing laboratory.
   e. Integral color with all colored components matched in accordance with SAE J 1545 to within plus or minus 1.0 on the CIE-LCH scales.
   f. Same finish on exposed surfaces.

2.2 CORNER GUARDS

A. Resilient, Shock-Absorbing Corner Guards: Surface mounted as shown on Drawings, formed to profile shown.

1. Snap-on corner guard formed from resilient material, minimum 0.078-inch thick, free floating on a continuous 0.063-inch-thick extruded aluminum retainer. Provide appropriate mounting hardware, cushions and base plates as required.
2. Provide factory-fabricated end closure caps at top and bottom of surface mounted corner guards.

2.3 CHAIR RAILS, WALL GUARDS AND HANDRAILS

A. Resilient Chair Rails, Wall Guards and Handrails:
1. Handrails: Snap-on covers of resilient material, minimum 0.078-inch thick, shall be free-floated on a continuous, extruded aluminum retainer, minimum 0.072-inch thick, anchored to wall at maximum 30 inches on center. For profiles, sizes, and locations, see Drawings.
2. Chair Rails and Wall Guards (Crash Rails): Snap-on covers of resilient material, minimum 0.110-inch thick, shall be free-floated over 2-inch-wide aluminum retainer clips, minimum 0.090-inch thick, anchored to wall at maximum 24 inches on center, supporting a continuous aluminum retainer, minimum 0.062-inch thick; or, shall be free-floated over a continuous extruded aluminum retainer, minimum 0.090-inch thick anchored to wall at maximum 24 inches on center. For profiles, sizes, and locations, see Drawings.
3. Provide handrails, chair rails and wall guards (crash rails) with prefabricated and closure caps, inside and outside corners, concealed splices, cushions, mounting hardware and other accessories as required. End caps and corners shall be field adjustable to assure close alignment with handrails, chair rails and wall guards (crash rails). Screw or bolt closure caps to aluminum retainer.

2.4 HIGH-IMPACT WALLCOVERING

A. Fabricate from vinyl acrylic or polyvinyl chloride-resilient material, minimum 0.06-inch thick, designed especially for interior use.
B. Coordinate with guard rail protection material and supplier for proper fit, installation and color.
C. Provide adhesive as recommended by the wallcovering manufacturer.

2.5 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, submit shop drawings showing proposed installation details.

2.6 FINISH

A. In accordance with NAAMM AMP 500 series.

B. Aluminum:
   1. Exposed Aluminum: AAC22A31 chemically etched medium matte, with clear anodic coating, Class II Architectural, 0.4 mil thick.
   2. Concealed Aluminum: Mill finish as fabricated, uniform in color and free from surface blemishes.
C. Resilient Material: Embossed texture and color in accordance with SAE J 1545 and as indicated in the Finish Schedule on the Drawings.

PART 3 - INSTALLATION

3.1 RESILIENT CORNER GUARDS

A. Install corner guards on walls in accordance with manufacturer's instructions.

3.2 RESILIENT HANDRAILS, RESILIENT CHAIR RAILS AND RESILIENT WALL GUARDS (CRASH RAIL)

A. Secure guards to walls with mounting cushions, brackets, and fasteners in accordance with manufacturer's details and instructions.
B. Install handrails, chair rails, and wall guards at elevations in compliance with ADA/ABA, at existing hospital height, if existing height is in compliance with applicable codes and regulations.

3.3 HIGH-IMPACT WALLCOVERING

A. Surfaces to receive protection shall be clean, smooth and free of obstructions.
B. Apply with adhesive in controlled environment according to manufacturer’s recommendations.

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SECTION 10 28 00
TOILET AND SHOWER 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. Combination paper towel dispenser and disposal unit.
3. Waste receptacles.
4. Toilet tissue dispenser.
5. Grab bars.
6. Shower curtain rods.
7. Clothes hooks, robe or coat.
8. Towel bars.
9. Metal-framed mirror.
10. Frameless, polished-edge mirrors.
11. Medicine cabinet.
12. Foot-operated soap dispenser.
13. Soap dishes.
14. Paper cup dispenser.
15. Mop racks.
16. Stainless-steel shelves, Type 44, Type 45, or Type 45C, as shown on Drawings.
17. Stainless-steel shelves at wheelchair lavatory.
18. Diaper changing station.

C. This Section also specifies custom-fabricated items used in toilets and related spaces.

1.2 RELATED WORK

A. Color of Finishes: As indicated in the Finish Schedule on the Drawings.

B. Color of Vinyl Fabric: As indicated in the Finish Schedule on the Drawings.

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, showing shelf where required, fillers, and design and installation of units when installed on ceramic tile wainscots and offset surfaces.
4. Shower curtain rods, showing required length for each location.
5. Grab bars, showing design and each different type of anchorage.
6. Medicine cabinets showing design and installation.
7. Foot-operated soap dispenser, showing anchorage and components.
8. Show material and finish, size of members, and details of construction, installation and anchorage of mop racks.

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.
4. Mop racks.

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 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 site at appropriate time for building-in.

D. Deliver products to 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

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

FF-S-107C.....Screw, Tapping and Drive

WW-P-541E(1).....Plumbing Fixtures (Accessories, Land Use) Detail 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, and for mirror doors in medicine cabinets.
2. ASTM C1036, Type 1 Class 1 Quality q3, for shelves in medicine cabinets.

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. Expansion Shields: Lead or plastic as recommended by accessory manufacturer for component and substrate for use in solid masonry or concrete.

F. Screws:

1. ASME B18.6.4.
2. Fed Spec. FF-S-107, Stainless steel Type A.

G. Adhesive: As recommended by manufacturer for products to be joined.

2.3 FINISH

A. In accordance with NAAMM AMP 500 series.

B. Anodized Aluminum: AA-C22A41, Chemically etched medium matte, with clear anodic coating, Class I Architectural, 0.7-mil thick.

C. AA-M32: Mechanical finish, medium satin.

1. Chromium Plating: ASTM B456, satin or bright as specified, Service Condition No. SC2.
2. Stainless Steel: NAAMM AMP 503, Finish 4.
3. Ferrous Metal:
   a. Shop Prime: Clean, pretreat, and apply 1 coat of primer and bake.
   b. Finish: Over primer, apply 2 coats of alkyd or phenolic resin enamel, and bake.
4. Nylon-Coated Steel: Nylon coating powder formulated for a fluidized bonding process to steel to provide a hard smooth, medium gloss finish, not less than 0.012-inch thick, rated as self-extinguishing when tested in accordance with ASTM D635.

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 COMBINATION PAPER TOWEL DISPENSER AND DISPOSAL UNITS

A. 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 10.5-gallon capacity, fabricated of 0.018-inch-thick stainless steel.

2.7 WASTE RECEPTACLES

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 TISSUE 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.

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 or swing up.

D. Bars:

1. Fabricate from 1-1/2-inch outside diameter tubing.
   a. Stainless steel, minimum 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 3 sides of showers, bars may be fabricated in 2 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 0.1046-inch thick, approximately 3-inch diameter by 1/2-inch deep, with provisions for not less than 3 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 3/16-inch thick, approximately 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 4 equally spaced holes, sized to accommodate 3/8-inch-diameter bolts, not more than 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 0.1046-inch-thick metal.
2. Fabricate in 1 piece, approximately 1/4-inch deep, with diameter sized to fit flange. Provide slotted holes to accommodate anchor bolts.

3. Furnish through-bolt fasteners and cap nuts, where grab bars are mounted on solid phenolic or solid polyethylene partitions.

2.10 SHOWER CURTAIN RODS

A. Stainless-steel tubing, ASTM A569, minimum 0.050-inch wall thickness, 1-1/4-inch outside diameter.

B. Flanges, stainless-steel rings, 2-5/8-inch minimum outside diameter, with 2 holes opposite each other for 1/4-inch stainless-steel fastening bolts. Provide a set screw within the curvature of each flange for securing the rod.

C. Intermediate support for rods over 6 feet long. Provide adjustable ceiling flanges with set screws, tubular hangers and stirrups.

2.11 CLOTHES HOOKS-ROBE OR COAT

A. Fabricate hook units either of chromium-plated brass with a satin finish or stainless steel, using 1/4-inch minimum thick stock, with edges and corners rounded smooth to the thickness of the metal, or 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

A. Fed. Spec. WW-P-541/8B, Type IV, Bar, Surface mounted; Class 1, towel.

B. Either stainless steel or chromium-plated copper alloy.

C. Bar Length: 18 and 24 inches, as shown.

D. Finish of brackets or supports same as bar.

2.13 METAL FRAMED MIRRORS

A. Fed. Spec. A-A-3002 metal frame; stainless steel, Type 302 or 304./

B. Mirror Glass:

1. Minimum 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 3/8-inch wide. Fabricate with square corners.
2. Use 0.0359-inch-thick stainless steel.
3. Filler:
   a. Where mirrors are mounted on walls having ceramic tile wainscots not flush with wall above, provide fillers at void between back of mirror and wall surface.

b. Fabricate fillers from same material and finish as the mirror frame, contoured to conceal the void behind the mirror at sides and top.

4. Attached Shelf for Mirrors:
   a. Fabricate shelf of the same material and finish as the mirror frame.
   b. Make shelf approximately 5 inches in depth, and extend full width of the mirror.
   c. Close the ends and the front edge of the shelf to the same thickness as the mirror frame width.
   d. Form stainless-steel shelf with concealed brackets to attach to mirror frame.

D. Back Plate:
1. Fabricate backplate for concealed wall hanging of either zinc-coated or cadmium-plated 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 FRAMELESS MIRRORS

A. Mirror Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality Q1 (mirror select); silvering, protective coating and physical characteristics complying with ASTM C1503; 6 mm minimum thickness, with polished beveled edges, and of size as noted on the Drawings.

B. Mirror Attachment Accessories: Stainless-steel clips with neoprene setting blocks, or mirror adhesive chemically compatible with mirror coating and wall substrate. Install as indicated on Drawings.

2.15 MEDICINE CABINETS

A. Fed. Spec. WW-P-541/8B, Type III Medicine cabinets.
1. Mirror Glass: Minimum 3/16-inch thick. Set mirror in a protective vinyl glazing tape.
2. Glass Shelves: Minimum 1/4-inch thick, with bulb-edges at front. Support shelves on adjustable aluminum brackets. Provide 3 shelves to each cabinet.
3. Cabinet Body: Fabricate from 0.036-inch-thick stainless steel. Form body in one piece, without seams, and with rounded inside corners.

B. Hinged Door Type:
   1. Class 2, swing door, Style R, recessed.
   2. Fabricate mirror door approximately 16 by 22 inches.
   3. Cabinet concealed when doors are closed.
   4. Mirror Door Frame: Channel shape, 0.036-inch-thick stainless steel.
   5. Furnish door with full-length, stainless-steel piano hinge, magnetic or friction catches, rubber bumpers, and a 90-degree restraining arm with spring-type stop.
C. Sliding Door Type:
   1. Class 1, slide door, Style R, recessed.
   2. Fabricate sliding doors for approximately 26- by 22-inch opening.
   3. Provide nylon glides in stainless-steel tracks, door pulls and rubber bumpers.
   4. Entire contents of the cabinet concealed when doors closed.

2.16 FOOT-OPERATED SOAP DISPENSER

A. Wall-mounted liquid soap dispenser, designed with an adjustable needle valve to allow dispensing of 2 milliliters of liquid with each depression of foot pump.
B. Connect foot pump, by a 6-foot air tube, to a 30-ounce liquid container. Provide air intake tube with a special feature to prevent liquid from dripping after release of pedal.
C. Operate pump by a slip-resistant, rubber padded pedal.
D. Complete unit shall not be adversely affected by the liquid soap, aseptic detergent, or hexachlorophene solutions.
E. Provide a removable gummed label, attached to container, stating that soap or detergent may be used in the dispensers.

2.17 SOAP DISHES

A. Fed. Spec. WW-P-541/8B, Type VI, Holder.
B. Class 1, Surface Mounted:
   1. One piece with provisions for exposed fasteners.
   2. Fabricate from chromium-plated brass approximately 4-1/2 by 3-3/4 inches overall size with drainage openings at bottom.

2.18 PAPER CUP DISPENSER

A. Fabricate of stainless steel.
B. Provide door with either concealed stainless-steel pivoting rod or piano hinge, and either spring tension cam lock or tumbler lock, keyed alike when more than one accessory unit is provided and with a cup level refill sight slot in the door front.
C. Fabricate for flat bottom cups.

D. 3-ounce Dispenser Unit:
   1. Surface-mounted, single-stack dispenser unit having a capacity of approximately 100 cups.
   2. Form door from one piece to cover front and sides warp free.
E. 4-ounce Dispenser Unit:
   1. Recessed type single stack dispenser unit having a capacity of approximately 100 cups.
   2. Form face frame in one piece.
   3. Fabricate door double-pan warp free.
F. Combination 3- to 6-ounce Dispenser and Disposal Unit:
   1. Recessed type, having a capacity of approximately 170 cups.
   2. Fabricate as twin-stack dispenser unit with an adjustable dispensing mechanism to dispense any size cup.
   3. Fabricate face frames in one piece and doors double pan warp free.
   4. Fabricate recessed disposal unit with a removable waste receptacle having a capacity of not less than 3.1 gallons.

2.19 MOP RACKS

A. Minimum 40 inches long with 5 holders.
B. Clamps:
   1. Minimum of 0.050-inch-thick stainless-steel bracket retaining channel with a hard rubber serrated cam; pivot mounted to channel.
   2. Clamps to hold handles from 1/2-inch minimum to 1-1/4-inch maximum diameter.
C. Support:
   1. Minimum of 0.0375-inch-thick, stainless-steel, hat-shape channel to hold clamps away from wall as shown.
   2. Drill wall flange for 1/8-inch fasteners above and below clamp locations.
D. Secure clamps to support with oval head machine screws or rivets into continuous reinforcing back of clamps.
E. Finish on Stainless Steel: AMP 503-No. 4.

2.20 STAINLESS-STEEL SHELVES (TYPE 44)

A. Shelves:
   1. Fabricate shelves of 0.0478-inch-thick sheet to size and design shown.
   2. Fabricate shelves of hollow metal type construction, forming a depression as shown, with closed fronts, backs, ends and bottoms. Reinforce shelves with 0.0478-inch-thick sheet steel hat channel

stiffeners, full depth, welded to underside of top at bracket locations.

3. Miter cuts, where made at corners of shelves, continuously welding.

B. Form brackets of 1/8-inch-thick steel as shown. Drill brackets for 1/4-inch anchor bolts.

C. Weld or screw brackets to shelves.

2.21 STAINLESS-STEEL SHELVES, TYPES 45, 45C

A. Fabricate shelves and brackets to design shown of 0.0478-inch-thick stainless steel.

B. Round and finish smooth projecting corners of shelves and edge corners of brackets. Drill brackets for 1/4-inch anchor bolts.

C. Screw or weld brackets to shelves.

2.22 STAINLESS-STEEL SHELVES AT WHEELCHAIR LAVATORY

A. Side-wall Mounted:

1. Fabricate to size and shape shown of 0.0478-inch-thick sheet.
2. Turn up edges and weld corners closed.
3. Fabricate brackets and weld to shelf. Drill brackets for 1/4-inch anchor bolts.

B. Back-wall Mounted:

1. Fabricate to size and shape shown of plate and tube.
2. Turn up edges and weld corners of shelf.
3. Weld tube to back plate and shelf, weld back plate to shelf, filler plate to tube, and corners of shelf with continuous welds.
4. Drill back plate for 1/4-inch anchor bolts.

2.23 DIAPER CHANGING STATION

A. Wall-mounted, folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.

1. Style: Horizontal.
2. Material: Polyethylene.
3. Mounting: Surface.
4. Color: Gray.
5. Minimum Rated Load: 250 pounds.
6. Manufacturers:

a. American Specialties, Inc.: www.americanspecialties.com.
b. Bradley Corporation: www.bradleycorp.com.
c. Diaper Deck & Company: www.diaperdeck.com.
d. Koala Kare Products: www.koalabear.com.
e. Or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before starting work, notify Contracting Officer’s Representative (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 or hollow masonry. Expansion bolt to concrete or solid masonry.

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 SCHEDULE OF ACCESSORIES

A. As indicated on the Drawings.

3.4 CLEANING

A. 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 0.0359-inch-thick sheet steel.
B. Fabricate door and trim from 0.0478-inch-thick sheet steel with all face joints fully welded and ground smooth.
   1. Glaze doors with 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 semigloss white enamel.
B. Finish door, frame with manufacturer's standard baked-on prime coat suitable for field painting.

PART 3 – EXECUTION

3.1 INSTALLATION

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 39 inches above finished floor.

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SECTION 12 32 00
MANUFACTURED WOOD CASEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies plastic laminate casework as detailed on the Drawings, including related components and accessories required to form integral units. Wood casework items shown on the Drawings, but not specified below shall be included as part of the Work under this Section, and applicable portions of the Specification shall apply to these items. Each like item of casework shall be of the same design and by one manufacturer.

B. Where shown, provide plastic laminate casework items including base cabinets, countertops, and wall cabinets, as shown on the Drawings.

1.2 RELATED WORK

A. Color and Finish of Plastic Laminate: As shown on the Finish Schedule on the Drawings.

1.3 MANUFACTURER'S QUALIFICATIONS

A. The fabrication of casework shall be by a manufacturer who produces casework similar to the casework specified and shown.

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. Sinks, trim and fittings.
   2. Locks for doors and drawers.
   3. Adhesive cements.

C. Samples: Countertop, plastic laminate, 6-inch square.

D. Shop Drawings (1/2 full size):
   1. All casework, showing details of construction, including materials, hardware and accessories.
   2. Cabinets and counters showing faucets in connection with sink bowls, and electrical fixtures and receptacles which are mounted on cabinets and counters.
   3. Fastenings and method of installation.

E. Mock-Up: Where required for special casework and where 4 or more similar units are involved, submit a mock-up of a typical unit for approval by Contracting Officer’s Representative (COR).

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):
A167-99 (R2009).....Stainless and Heat-Resisting chromium-Nickel Steel Plate, Sheet and Strip
A1008-10.....Steel, Sheet, Cold-Rolled, Carbon, Structural, High Strength Low Alloy
C1036-06.....Flat Glass

C. U.S. Department of Commerce Product Standards (Prod. Std.):
PS1-95.....Construction and Industrial Plywood

D. Hardwood, Plywood and Veneer Association (HPVA):
HP-1-09.....Hardwood and Decorative Plywood

E. Architectural Woodwork Institute (AWI):
Architectural Woodwork Quality Standards, Guide Specifications Quality Certification Program - 1999

F. American Society of Mechanical Engineers (ASME):
A112.18.1-05.....Plumbing Fixture Fittings

G. National Electrical Manufacturers Association (NEMA):
LD3-05.....High Pressure Decorative Laminates
LD3.1-95.....Performance, Application Fabrication and Installations of High-Pressure Decorative Laminates

PART 2 - PRODUCTS

2.1 PLASTIC LAMINATE

A. NEMA LD-3.

B. Exposed decorative surfaces including countertops, 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, LD3.1 as a minimum.
1. Plastic-laminate-clad plywood.

D. Backing sheet on bottom of plastic laminate covered wood tops. Backer Type BKL.

E. Post-Forming Fabrication, Decorative Surface: Post-forming Type HGP.

2.2 PLYWOOD, SOFTWOOD

A. Prod. Std. PS1, 5-ply construction from 1/2-inch to 1-1/8-inch thickness, and 7-ply for 1-1/4-inch thickness.

2.3 PARTICLEBOARD

A. The use of particleboard is not allowed.

2.4 RUBBER OR VINYL BASE

A. Unless otherwise indicated on the Drawings, furnish straight (for carpet), cove (for resilient floor); 4-inch-high, 1/8-inch-thick, flexible to conform to irregularities in walls, partitions and floors.

2.5 PLUMBING FIXTURES

A. ASME A112.18.1, except die-cast zinc-alloy material is not acceptable.

2.6 GLASS: ASTM C1036

A. For Doors: Type I, Class 1, Quality q4.

2.7 SHEET STEEL

A. ASTM A1008.

2.8 STAINLESS STEEL

A. ASTM A167, with No. 4 finish.

2.9 HARDWARE

A. Where pin tumbler locks are specified, furnish locks with 7-pin removable cylinder cores tied to the door hardware locking system by Yale Hardware as specified under Section 08 71 00 – DOOR HARDWARE. Locks for each type casework shall be keyed differently and shall be master-keyed for each type service, such as Nurses, Psychiatric, and Administration. Provide 2 keys for each lock. Exposed hardware, except as otherwise specified, shall be satin-finished, chromium-plated brass or nickel-plated brass.

B. Marking of Locks and Keys:

1. The name of the manufacturer, or trademark by which manufacturer can readily be identified, legibly marked on each lock.
2. The key change number marked on the exposed face of lock, and also stamped on each key.
3. Key change numbers shall provide sufficient information for replacement of the key by the manufacturer.

C. Hinged Doors:

1. Doors 36 inches and more in height shall have 3 hinges and doors less than 36 inches in height shall have 2 hinges. Each door shall close against 2 rubber bumpers.
2. Hinges: Fabricate hinges with minimum 0.072-inch-thick chromium-plated steel leaves, and with minimum 0.139-inch-diameter stainless-steel pin. Hinges shall be 5-knuckle design with 2-1/2-inch-high leaves and hospital type tips.

3. Fasteners: Provide full-thread wood screws to fasten hinge leaves to door and cabinet frame. Finish screws to match finish of hinges.

D. Door Catches:
1. Friction or Magnetic type, fabricated with metal housing.
2. Provide 1 catch for cabinet doors 48 inches high and under, and 2 for doors over 48 inches high.

E. Locks:
1. Cylinder type pin tumbler.
2. Equip doors and drawers where shown with locks as specified under paragraph 2.9 A. of this Section.

F. Drawer and Door Pulls: Doors and drawers shall have wire pulls, per BO2001, fabricated of either chromium-plated brass, chromium-plated steel, stainless steel, or anodized aluminum.

G. Drawer Slides:
1. Full extension steel slides with nylon ball-bearing rollers.
2. Slides shall have positive stop.
3. Equip drawers with rubber bumpers.

H. Shelf Standards (Except For Fixed Shelves): Bright zinc-plated steel for recessed mounting with screws, 5/8-inch-wide by 3/16-inch-high providing 1/2-inch adjustment, complete with shelf supports.

I. Gate Bolt: Surface-mounted barrel type with strike.

J. Hinged Gates: Gates shall have two double-acting hinges or pivots, size as required.

2.10 FABRICATION

A. Casework shall be of the flush overlay design and, except as otherwise specified, be of premium grade construction and of component thickness in conformance with AWI Quality Standards.

B. Fabricate casework of plastic-laminated covered plywood as follows:
1. Where shown, gates, doors, drawers, shelves, and all semi-concealed surfaces shall be plastic laminated.
2. Glazed doors shall have 3/16-inch-thick glass, set in glazing compound.

C. Electrical fixtures, receptacles, wiring and junction boxes required for fixtures and receptacles:
1. Factory installed in casework.
2. For electrical lighting fixtures, see Drawings.
3. For electric receptacles and lighting fixtures installed below or adjacent to wall cabinets or above countertops, see Electrical Sections of Specifications.

4. Install wiring in built-in raceways and terminate at junction box mounted on rear of cabinet and counter.
5. For final hook-up at junction box see Electrical Sections of Specifications.

D. Base:
1. Provide rubber or vinyl base with close, flush joints; set with adhesive.
2. Remove adhesive from exposed surfaces.
3. Install base at floor line after casework has been accurately leveled.
4. Rub base to glossy finish.

E. Countertops:
1. Countertops, splashbacks, and reagent type shelves shall be plastic laminate factory glued to either a plywood (PS1) core.
2. Countertops shall be 1-1/4 inches thick.
3. Splashbacks and reagent type shelves shall be finished 3/4-inch thick and be secured to countertops with concealed metal fastenings and with contact surfaces set in waterproof adhesive.
4. Provide cut-outs for plumbing trim where shown.
5. Cover exposed edges of countertops, splashbacks, and reagent type shelves with plastic.

F. Sink Bowls:
1. 18-gage stainless steel, of size and design shown.
2. All interior corners of bowls shall be formed to manufacturer's standard radii.
3. Sinks shall have rims with flanged edges overlapping tops to provide tight joints.
4. Secure sink bowls with concealed fastenings.
5. For service lines from service fixtures, see other sections of specifications.

G. Provide the following plumbing trim and fittings:
1. Faucets: ASME A112.18.1 Type I, compression type, countertop-mounted, chromium-plated brass, having 2 valves and with swing-spout and gooseneck spout as shown, elevated to clear handles.
2. Fittings shall have an elongated escutcheon for spout and handles, replaceable valve seats and 4 arm or lever style indexed chromium-plated brass or stainless-steel handles; handles either with or without hood.

H. Faucets:

1. ASME A112.18.1 Type I, compression type, splashback-mounted, chromium-plated brass, having 2 valves and with swing-spout and/or gooseneck spout as indicated.
2. Fittings shall have exposed body union inlets and adjustable flanges.
3. Valves shall have indexed chromium-plated brass or stainless-steel lever handles and replaceable valves seats; handles either with or without hood.

I. Drain:
1. Cast or wrought brass or stainless steel with flat strainer.
2. Surfaces of drains exposed from above shall have a chromium-plated finish.

J. Traps: Cast brass.

K. Spray Hose:
1. Hose shall drop below countertop when not in use and be of sufficient length to reach the entire length of the countertop.
2. Concealed trim may be rough brass.

L. Support Members for Tops of Tables:
1. Construct as detailed.
2. Provide miscellaneous steel members and anchor as shown.

M. Legs for Counters:
1. Fabricate legs for counters of 0.0635-inch-thick, 1-1/2-inch-square tubular stainless steel where shown.
2. Secure legs to countertops and provide legs at bottom with shoes not less than 1 inch in height.
3. Fabricate shoes of either stainless steel, aluminum or chromium-plated brass.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set casework in place; level, plumb and accurately scribe and secure to walls, and/or floors.

B. The installation shall be complete including all trim and hardware. Leave the casework clean and free from defects.

3.2 FASTENINGS

A. Fastenings for securing casework to adjoining construction shall be as detailed on the Drawings or approved shop drawings.

B. See Section 05 50 00, METAL FABRICATIONS for reinforcement of walls and partitions for casework anchorage.

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