



**TRUEBEAM STX SITE PREP PROJECT
FOR
JAMES A. HALEY VETERANS HOSPITAL
TAMPA, FLORIDA**

Specifications Manual

for

**DEPARTMENT OF VETERANS AFFAIRS
VA Project Number 673-CSI-101**

**REVISED 100% SET DOCUMENTS
September 19, 2014**

THIS PAGE INTENTIONALLY LEFT BLANK

**RENOVATIONS AND MODIFICATIONS
FOR TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL**

**TABLE OF CONTENTS
Section 00 01 10**

		Page #
	DIVISION 0 - SPECIAL SECTIONS	
00 01 15	List of Drawing Sheets	
	DIVISION 1 - GENERAL REQUIREMENTS	
01 00 00	General Requirements	
01 32 16	Project Schedules	
01 33 23	Shop Drawings, Product Data, and Samples	
01 42 19	Reference Standards	
01 45 29	Testing Laboratory Services	
01 57 19	Temporary Environmental Controls	
01 58 16	Temporary Interior Signage	
01 74 19	Construction Waste Management	
	DIVISION 2 - EXISTING CONDITIONS	
02 41 00	Demolition	
	DIVISION 3 - CONCRETE	
03 30 00	Cast-in-Place Concrete	
	DIVISION 4 - MASONRY	
	Not Used	
	DIVISION 5 - METALS	
	Not Used	
	DIVISION 6 - WOOD AND PLASTIC	
	Not Used	
	DIVISION 7 - THERMAL AND MOISTURE PROTECTION	
07 56 00	Fluid-Applied Flashing	
07 84 00	Firestopping	
	DIVISION 8 - DOORS AND WINDOWS	
08 11 13	Hollow Metal Doors and Frames	

08 14 00	Interior Wood Doors	
08 42 29	Automatic Sliding Door Systems	
08 71 00	Door Hardware	
	DIVISION 9 - FINISHES	
09 22 16	Non-Structural Metal Framing	
09 29 00	Gypsum Board	
09 51 00	Acoustical Ceilings	
09 65 13	Resilient Base and Accessories	
09 65 16	Resilient Sheet Flooring	
09 65 19	Resilient Tile Flooring	
09 91 00	Painting	
	DIVISION 10 - SPECIALTIES	
10 14 00	Signage	
10 21 23	Cubicle Curtain And Tracks	
10 26 00	Wall and Door Protection	
	DIVISION 11 - EQUIPMENT	
	Not Used	
	DIVISION 12 - FURNISHINGS	
12 32 00	Manufactured Wood Casework	
12 36 00	Countertops	
	DIVISION 13 - SPECIAL CONSTRUCTION	
	Not Used	
	DIVISION 14- CONVEYING EQUIPEMENT	
	Not Used	
	DIVISION 21- FIRE SUPPRESSION	
21 05 11	Common Work Results for Fire Suppression	
21 13 13	Wet Pipe Sprinkler Systems	
	DIVISION 22 - PLUMBING	
22 05 11	Common Work Results for Plumbing	
22 11 00	Facility Water Distribution	
22 13 00	Facility Sanitary Sewerage	
22 40 00	Plumbing Fixtures	
22 62 00	Gas Systems for Laboratory and Healthcare Facilities	

	DIVISION 23 - HEATING, VENTILATING, & AIR CONDITIONING	
23 05 11	Common Work Results for HVAC and Steam Generation	
23 05 41	Noise and Vibration Control for HVAC Piping and Equipment	
23 05 93	Testing, Adjusting, and Balancing for HVAC	
23 07 11	HVAC, Plumbing, and Boiler Plant Insulation	
23 09 23	Direct-Digital Control System for HVAC	
23 31 00	HVAC Ducts and Casings	
23 36 00	Air Terminal Units	
23 37 00	Air Outlets and Inlets	
23 82 16	Air Coils	
	DIVISION 26 - ELECTRICAL	
26 05 11	Requirements for Electrical Installations	
26 05 21	Low-Voltage Electrical Power Conductors & Cables (600 Volts & Below)	
26 05 26	Grounding and Bonding for Electrical Systems	
26 05 33	Raceway and Boxes for Electrical Systems	
26 27 26	Wiring Devices	
	DIVISION 27 - COMMUNICATIONS	
27 05 11	Requirements for Communications Installations	
27 15 00	Communications Horizontal Cabling	
27 52 23	Nurse Call/Code Blue Systems	
	DIVISION 28 - ELECTRONIC SAFETY AND SECURITY	
28 31 00	Fire Detection and Alarm	
	DIVISION 31 - EARTHWORK	
	Not Used	
	DIVISION 32 - EXTERIOR IMPROVEMENTS	
	Not Used	
	DIVISION 33 - UTILITIES	
	Not Used	
	DIVISION 34 - TRANSPORTATION	
	Not Used	

--	--	--

SECTION 00 01 15
LIST OF DRAWING SHEETS

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

<u>Drawing No.</u>	<u>Title</u>
GENERAL	
GI000	COVER SHEET
GI001	LEGEND, ABBREVIATIONS, CODE SUMMARY, INDEX
GI101	LIFE SAFETY PLAN
ARCHITECTURAL	
AD101	DEMOLITION PLAN
AE101	NEW FLOOR PLAN + KEY PLAN
AE102	ENLARGED FLOOR PLANS
AE103	REFLECTED CEILING PLANS
AE104	EQUIPMENT PLAN
AE201	SECTION AND INTERIOR ELEVATIONS
AE501	WALL TYPES & DETAILS
AF601	SCHEDULES & DETAILS
STRUCTURAL	
S101	PARTIAL PLANS & SECTIONS
MECHANICAL	
MD100	MECHANICAL FLOOR PLAN - DEMOLITION
MH200	MECHANICAL NOTES, LEGEND, DETAILS & SCHEDULES
MH201	MECHANICAL FLOOR PLAN & ROOF PLAN
ELECTRICAL	
EI100	ELECTRICAL LEGEND, DETAILS, AND NOTES
ED101	ELECTRICAL DEMOLITION - FLOOR PLAN
EL101	ELECTRICAL FLOOR PLAN - LIGHTING
EP101	ELECTRICAL FLOOR PLAN - POWER & SYSTEMS
EP102	ELECTRICAL WIRING AND CONDUIT DIAGRAMS

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

ES101

SYSTEMS WIRING DIAGRAMS

PLUMBING

PD100

PLUMBING & MED GAS FLOOR PLAN - DEMOLITION

PL200

PLUMBING FLOOR PLAN, NOTES, SCHEDULES, & DETAILS

FIRE PROTECTION

FP100

FIRE PROTECTION FLOOR PLAN

- - - E N D - - -

**SECTION 01 00 00
GENERAL REQUIREMENTS**

PROJECT NUMBER: 673-CSI-101 TRUEBEAM STX SITE PREP PROJECT

TABLE OF CONTENTS

1.1 GENERAL INTENTION.....	1
1.2 STATEMENT OF BID ITEM(S).....	3
1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR.....	3
1.4 CONSTRUCTION SECURITY REQUIREMENTS.....	3
1.5 FIRE SAFETY.....	6
1.6 OPERATIONS AND STORAGE AREAS.....	10
1.7 ALTERATIONS.....	18
1.8 INFECTION PREVENTION MEASURES.....	20
1.9 DISPOSAL AND RETENTION.....	23
1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS.....	25
1.11 RESTORATION.....	27
1.12 PHYSICAL DATA.....	28
1.13 PROFESSIONAL SURVEYING SERVICES.....	28
1.14 LAYOUT OF WORK.....	28
1.15 AS-BUILT DRAWINGS.....	29
1.16 USE OF ROADWAYS, PARKING LOTS, AND GROUNDS.....	30
1.17 COTR and CONTRACING OFFICER'S FIELD OFFICES.....	31
1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT.....	31
1.19 TEMPORARY USE OF EXISTING ELEVATORS.....	32
1.20 TEMPORARY TOILETS.....	33
1.21 AVAILABILITY AND USE OF UTILITY SERVICES.....	34
1.22 NEW TELEPHONE EQUIPMENT.....	36
1.23 TESTS / COMMISSIONING.....	36
1.24 INSTRUCTIONS.....	37
1.25 GOVERNMENT-FURNISHED PROPERTY.....	38
1.26 RELOCATED EQUIPMENT AND ITEMS	39
1.27 STORAGE SPACE FOR DEPARTMENT OF VETERANS AFFAIRS EQUIPMENT.....	40
1.28 CONSTRUCTION SIGN.....	40
1.29 SAFETY SIGN.....	41
1.30 CONSTRUCTION DIGITAL IMAGES.....	41
1.31 FINAL ELEVATION DIGITAL IMAGES.....	43
1.32 HISTORIC PRESERVATION.....	43
1.33 EQUIPMENT.....	43
1.34 FINAL PAYMENT.....	43
1.35 WARRANTY CALLS.....	43
1.36 ATTACHMENTS.....	43

PROJECT DESCRIPTION

The EP (Electro-Physiology) Lab at the James A. Haley Veterans Hospital in Tampa, Florida is a project that will facilitate the treatment of patients. The EP Lab is a dedicated area where the medical staff can treat patients.

This project will coincide with the construction of the EP Lab Recovery project which is expected to be built at the same time as this project.

This project will entail architectural, mechanical, electrical, structural, asbestos, interior design and plumbing renovations. Refer to drawings and specifications provided in bid package for this project.

1.1 GENERAL INTENTION

- A. Contractor shall completely prepare site for building operations, including demolition and other items as indicated herein. The Contractor shall furnish all necessary equipment, labor, materials, temporary equipment and items, tools, specialty services, supervision, and perform work for CSI Project No. 673-CSI-101 TRUEBEAM STX SITE PREP at the James A. Haley Veterans Hospital located in Tampa, Florida as required by drawings and specifications.
- B. Visits to the site by Bidders are highly recommended and may be made only by appointment with the Project Manager/Contracting Officer's Technical Representative (COTR), Guy Unger at telephone number (813) 972-2000 extension 4850. All bids will take into consideration of existing site conditions; it is the responsibility of the contractor to review the entire job site footprint and existing site conditions prior to bid submission. All proposals shall include a detailed cost breakdown (materials, labor, and equipment) by trade, specification division and section; lump sum costs are not acceptable.
- C. Offices of TTV Architects, as Architect Engineers (AE, A/E), will render certain technical services during construction. Such services shall be considered as advisory to the Government and shall not be construed as expressing or implying a contractual act of the Government without affirmations by Contracting Officer or his duly authorized representative.
- D. Before placement and installation of work subject to tests by testing laboratory or other parties retained by Department of Veterans Affairs, the Contractor shall notify the COTR and Contracting Officer (CO) 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 seven (7) calendar days, unless otherwise designated by the COTR and Contracting Officer.

- E. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission of the VA Police, be identified by project and employer, and restricted from unauthorized access.
- F. Prior to commencing work, general contractor shall provide proof that an OSHA certified "competent person" (CP) [(29 CFR 1926.20(b)(2)] will maintain a presence at the work site whenever the general or subcontractors are present.
- G. **Training:**
 - 1. Beginning July 31, 2005, all supervisory type personnel and employees of general contractor and subcontractors shall have the 30-hour OSHA certified Construction Safety course and other relevant competency training, as determined by VA CP with input from the ICRA team.
 - 2. Beginning July 31, 2005, all non-supervisory type personnel and employees of general contractor and subcontractors shall have the 10-hour OSHA certified Construction Safety Course and other relevant competency training, as determined by VA CP with input from the ICRA team.
 - 3. Submit copies of certificates and training records for all such personnel and employees that may be and/or will be on the work site(s) to the COTR and Contracting Officer for approval before the start of any work on-site.
- H. **Related Work:** This specification section applies to ALL Divisions (0 through 34) of work under ALL other specification sections. A partial list of Codes and Standards adopted by the Department of Veterans Affairs is attached in Appendix B.
- I. **Normal Operation / Construction Hours:** Construction operations at the James A. Haley VA Hospital are 7:30 AM to 4:30 PM, Monday through Friday, with the exception of Federal Holidays. Requests to work beyond normal work hours shall be submitted in writing to the Resident Engineer / COTR for approval and will include a description of work to be performed. Approval is subject to availability of the Resident Engineer / COTR, type of work to be performed, and the specific hours requested. Contractors are reminded that patients are generally asleep after 10:00 PM. Approval to work beyond this time will also include an

evaluation of the anticipated noise level generated by the contractor. Under no circumstances will the contractor proceed without express, written approval of the Resident Engineer / COTR.

1.2 STATEMENT OF BID ITEM(S)

- A. **ITEM I, GENERAL CONSTRUCTION:** Provide all necessary equipment, labor, materials, specialty services, supervision, and tools to complete **CSI Project No. 673-CSI-101 TRUEBEAM STX SITE PREP"**. Work includes architectural, asbestos abatement, mechanical, electrical, plumbing and interior designs and certain other items of work required by the drawings and specifications. All work is to be completed in **150 calendar days including weekend work and night shift work.**

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

- A. Additional sets of drawings and specifications may be made by the Contractor, at Contractor's expense, from PDF document copies that can be requested from the COTR's electronic files.
- B. Additional sets of drawings and specifications may be made by the Contractor, at Contractor's expense, from electronic or reproducible hard copy prints furnished by the ISSUING OFFICE. Such media or prints shall be returned to the ISSUING OFFICE immediately after printing is completed.

1.4 CONSTRUCTION SECURITY REQUIREMENTS

A. Security Plan:

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.
2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.
3. The General Contractor shall furnish to the COTR and Contracting Officer lists of employees that will be or may be on the construction site(s). The List shall be on Company letter head that provides all of the company contact information, shall provide the project number and title, locations of work, names of the employees, their titles, their job types, and personal contact numbers (i.e. cell phone). All sub-contractors, vendors and suppliers for the project shall furnish the same listing on their individual company letter heads to the GC whom will provide the lists to the COTR and Contracting Officer. These lists shall be updated as necessary

during the entire duration of the project. These lists may be used to provide a check list record of personnel on-site each day to be provided with the contractors Daily Log reports. These lists may be used to provide a check list record of personnel on-site each day to be provided to the VA Police Department and their Dispatch Office where normal sign in and sign out occurs.

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 provide a request for approval 14 calendar days prior to the requested date, to the Contracting Officer and COTR, so that security, escort and other appropriate arrangements can be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.
3. No photography of VA premises is allowed without written permission of the Contracting Officer.
4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer.

C. Guards:

1. The General Contractor shall not be required to provide unarmed guards at the project site twenty-four (24) hours a day, seven (7) days a week or after construction hours.
2. Any guard provided (if required by project) shall have communication devices to report events as directed by VA Police.
3. The General Contractor is not required to install equipment for recording guard rounds to ensure systematic checking of the premises.
4. The General Contractor may need to provide a guard as required by the contract drawings and specifications, including specification sections for Asbestos Abatement.

D. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the COTR and Contracting Officer 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 lock cylinders to the VA COTR and locksmith for permanent installation. See Section 08 71 00, DOOR HARDWARE and coordinate.
3. Contractor may be issued keys for construction through the COTR and Contracting Officer.
4. All keys must be turned in at the end of Contract.
5. Any key assigned to the contractor, which is lost or stolen will result in a replacement cost of \$100.00 per key either lost or stolen. Any key either lost or stolen shall be reported to the COTR; it is the contractor's responsibility to inform VA Police and give a detailed report about the key loss. The contractor shall take a copy of the official police report and make payment to the Agent Cashier before any additional replacement keys are made. Final payment may be withheld and or reduced until all keys are returned or accounted for. A copy of the Police Report and receipt of payment shall be provided to the VA COTR.

E. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".
2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.
3. Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer upon request.
4. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer.

5. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.
6. Notify Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".
7. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).
 - a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.
 - b. "Sensitive information" including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.

F. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted at least twenty-four (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.
3. There are no Contractor designated general parking areas. General Contractor parking is at the University Mall. The Patient Shuttle Services provided by the VA can be used on a first come, first served basis.

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):
 - E84-2008.....Surface Burning Characteristics of Building Materials
2. National Fire Protection Association (NFPA):
 - 10-2006.....Standard for Portable Fire Extinguishers
 - 30-2007.....Flammable and Combustible Liquids Code
 - 51B-2003.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work
 - 70-2007.....National Electrical Code

- 241-2004.....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. Hospital Policy Memorandums:
 - HPM 138-03.....Safety and Health during Construction
Activities
 - HPM 138-04.....Lockout / Tagout Program
 - HPM 138-15.....Interim Life Safety Measures (ILSM)
 - HPM 138-17.....Notification of Fire Alarm Shutdown
 - HPM 138-23.....Utility Shutdown Procedures
 - HPM 138-24.....Infection Control during Construction and
Renovation

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 COTR and Contracting Officer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Prior to any worker for the contractor or subcontractors beginning work, they 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. Documentation shall be provided to the COTR and Contracting Officer that individuals 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. Temporary Facilities: Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6.1 m (20 feet) exposing overall length, separate by 3.0 m (10 feet).

E. Temporary Construction Partitions:

- 1. Install and maintain temporary construction partitions to provide smoke-tight separations between, construction areas, the areas that are described in phasing requirements, and adjoining areas.

Construct partitions of gypsum board or treated plywood (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant treated wood or metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof. Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.

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

- 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 COTR and Contracting Officer.
- H. **Egress Routes for Construction Workers:** Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to the COTR and Contracting Officer.
- 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 with each floor in accordance with 29 CFR 1926 and NFPA 241. Do not charge wet standpipes subject to freezing until weather protected.
- 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 four (4) hours in a twenty-four (24) hour

period. Request interruptions in accordance with Article 1.6, OPERATIONS AND STORAGE AREAS, and coordinate with COTR and Contracting Officer. 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 COTR and Contracting Officer.

- N. **Smoke Detectors:** Prevent accidental operation. Remove temporary covers at end of work operations each day. Coordinate with COTR and Contracting Officer. Replace all smoke detection devices in the construction area with heat detection devices for the duration of the project. Prior to final project inspection, smoke detectors shall be reinstalled.
- O. **Hot Work (Burn Permit):** Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with COTR and Contracting Officer. Obtain permits from facility COTR and Contracting Officer at least seventy-two (72) hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work. See Appendix C for the proper procedure and forms for hot work.
- P. **Fire Hazard Prevention and Safety Inspections:** Inspect entire construction areas daily. Coordinate with, and report findings and corrective actions daily to COTR and Contracting Officer. See HPM 138-03.
- Q. **Smoking:** Smoking is prohibited in and adjacent to construction areas inside and outside of existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited, except in designated smoking rest areas.
- R. **Waste:** Dispose of waste and debris in accordance with NFPA 241. Remove from buildings and site daily.
- S. **Construction Operations:** Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.
- T. **Impaired Areas:** If required, submit documentation to the COTR and Contracting Officer that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.
- U. **Forms:** Forms for certain Fire Safety items are attached to this specification section.

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 COTR and the Contracting Officer. The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.
- B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the COTR and the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the COTR and the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.
- C. The Contractor shall, under regulations prescribed by the COTR and the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the COTR and the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.
- D. Working space and space available for storing materials shall be as determined by the COTR and Contracting Officer. The Contractor shall keep ALL work areas, storage areas, staging areas, and access areas and routes clean and neat. The Contractor shall provide sufficient trash containers so there is no debris lying around. The containers shall be emptied at the least daily and trash disposed of by the contractor.
- E. Workmen are subject to rules of the Medical Center applicable to their conduct. All personal automobiles and contractor vehicles shall be parked off-site, as there is no available parking on-site.
- F. Execute work in such a manner as to interfere as little as possible with work being done by others. Keep roads clear of construction materials, debris, standing construction equipment and vehicles at all times.

G. Execute work so as to interfere as little as possible with normal functioning of the 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 COTR and Contracting Officer 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 two (2) work days. Provide unobstructed access to the Medical Center areas required to remain in operation.
3. Where access by the 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 COTR and Contracting Officer. All such actions shall be coordinated with the Utility Company involved:

1. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.

I. **Phasing:** To insure such executions, Contractor shall furnish the COTR and Contracting Officer with a schedule of approximate phasing 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 COTR and Contracting Officer twenty-one (21) calendar days in advance of the proposed date of starting work in each specific area of site, building or portion thereof. Arrange such phasing dates to insure accomplishment of this work in successive phases mutually

agreeable to the Medical Center Director, COTR and Contracting Officer and Contractor.

1. The contractor is to submit his phasing schedule in writing to the Contracting Officer for review and approval no later than **twenty-one (21) calendar days** after issuance of the Notice to Proceed. This includes utility outages and access closures.
2. All work, such as corridor work, which is outside the main construction area, shall be done on evenings or weekends, so as not to disrupt the normal operations.
3. The contractor shall have **all** submittals completed and turned in to the Government for review by the A/E firm no later than **thirty (30) calendar days** from the date of the signed Notice to Proceed. The government will return submittals within **twenty-one (21) calendar days** from acceptance from the contractor. **NO WORK SHALL BE STARTED UNTIL ALL RELATED SUBMITTALS ARE APPROVED.** All materials shall be approved by the Government prior to delivery to the job site and start of work.
4. All renovation activities will take place at a busy Medical Center. The contractor shall not interfere with existing, on-going functions, or normal activity of the hospital. The contractor will provide walk-off mats for dust control, appropriate construction barriers, and keep noise & vibration to a minimum during normal business hours. Contractors shall review Hospital Policy Memorandum (HPM) No. 138-24, "Infection Control During Construction and Renovation" and comply as outlined in this policy. Certain portions of the work will be confined to evenings, and/or weekends, as identified on the drawings.
5. No work shall start until the preconstruction survey and inspection is completed.
6. Contractor to completely abate the entire job site footprint of all floor tile and asbestos mastic, and asbestos fireproofing and replace with non-asbestos tile, mastic, and fireproofing as per

Hospital Policy Memorandum No. 138-14 and per appropriate specification sections. The contractor shall provide detailed abatement schedule.

7. Any utility service, parking lot, roadway, loading dock, and/or Grounds interruptions requests shall be submitted in writing **twenty-one (21) calendar days** in advance of the planned interruption. For approval and coordination, see HPM 138-23.
8. Hot Work and other permits will be needed prior to the use of any open flames, cutting operations, grinding operations and welding operations. For approval and coordination, see Appendix C.
9. Set up phasing by buildings, wings, floors, or areas in accordance with information received from the Medical Center through the COTR and the Contracting Officer.
- J. **Vacated Buildings:** Building(s) will be vacated by Government in accordance with above phasing beginning immediately after date of receipt of Notice to Proceed and turned over to Contractor.
- K. **Occupied Buildings:** Building(s) will be occupied during performance of work; but immediate areas of alterations will be vacated.
 1. Certain areas of Building(s) will be occupied by Medical Center personnel for various periods. Contractor shall take all measures and provide all material necessary for protecting existing equipment and property in affected areas of construction against dust and debris, so that equipment and affected areas to be used in the Medical Centers operations will not be hindered. Contractor shall permit access to Department of Veterans Affairs's 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.

- L. **Buildings and Systems:** When a building is turned over to Contractor, Contractor shall accept entire responsibility therefore.
1. Contractor shall maintain a minimum temperature of 4 degrees C (40 degrees F) at all times, except as otherwise specified.
 2. Contractor shall maintain in operating condition existing fire protection and alarm equipment. In connection with fire alarm equipment, Contractor shall make arrangements for pre-inspection of site with Fire Department or Company (Department of Veterans Affairs or municipal) whichever will be required to respond to an alarm from Contractor's employee or watchman.
- M. **Existing Utilities Services:** Maintain existing utility services for the 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 a main branch or suitable places where shown; or, in absence of such indication, where directed by the COTR and Contracting Officer.
1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior written approval of the COTR and Contracting Officer. 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. The attached Live Electrical Work notification form must be used. See Appendix C for the proper forms and procedures.
 2. Contractor shall submit a request to interrupt any such services to the COTR and Contracting Officer, in writing, **twenty-one (21) calendar days** in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption. See Appendix C for the proper forms and procedures.

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 the 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 **twenty-one (21) calendar days** prior to the desired time and shall be performed as directed by the COTR and Contracting Officer.
 5. In case of a contract construction emergency, service will be interrupted on approval of the COTR and Contracting Officer. Such approval will be confirmed in writing as soon as practical. On the next business day, the contractor's Daily Log report shall explain the circumstances causing the emergency and the corrective actions taken.
 6. Whenever it is required that a connection fee be paid to a public utility provider for new permanent service to the construction project, for such items as water, sewer, electricity, gas or steam, payment of such fee shall be the responsibility of the Government and not the Contractor.
- N. **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 at the nearest main line or branch. 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 unless otherwise directed by the COTR and Contracting Officer.
- O. **Roads, Parking Lots, Docks and Grounds:** 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 one lane must be open to traffic at all times.

2. Method and scheduling of required cutting, altering and removal of existing roads, parking lots, walks and entrances must be approved by the COTR and Contracting Officer.
3. Interruptions of these areas must be requested, in writing, at least **twenty-one (21) calendar days** prior to the desired time and shall be performed as directed by the COTR and Contracting Officer.
4. Interruptions will follow the same procedures as outlined in Article 1.6.N.2, Existing Utility Services.

P. **Coordination of Work:** Coordinate the work for this contract with other construction operations as directed by the COTR and Contracting Officer. This includes the scheduling of traffic and the use of roadways, as specified in Article 1.16, USE OF ROADWAYS, PARKING LOTS, AND GROUNDS.

Q. **Coordination of Construction with Medical Center Director:** The activities at a Medical Center shall take precedence over construction activities. The Contractor must cooperate and coordinate with the Medical Center, through the COTR and Contracting Officer, in arranging construction schedule to cause the least possible interference with facility activities on the campus. Construction noise during the events or services shall not disturb the events or service. Trucks and workmen shall not pass through the event or service area during this period:

1. The Contractor is required to discontinue his work sufficiently in advance of Easter Sunday, Mother's Day, Father's Day, Memorial Day, Veteran's Day and/or Federal holidays, to permit him to clean up all areas of operation adjacent to existing event or service areas before these dates.
2. The Medical Center observes the following **Federal Holidays**: New Years Day, Labor Day, Martin Luther King Jr. Day, Columbus Day, Presidents Day, Veterans Day, Memorial Day, Thanksgiving, Independence Day, and Christmas Day.
3. Clean-up shall include the removal of all equipment, tools, materials and debris and leaving the areas in a clean, neat condition.

R. **SIGN-IN/OUT Procedures:**

1. All contractor employees are required to sign in and out at VA Police dispatch located in Building #1, First floor, A-Wing, Room 1A-147, near the Emergency Room Entrance, unless otherwise directed by the COTR. A valid state driver's license or state identification card is

- mandatory for all employees to have access to this facility. All employees are required to wear the assigned VA badges at all times.
2. If after-hour key service is needed, contact the Hospital Police Dispatch Office at extension 7554. All after hours work shall be coordinated through the Contracting Officer in writing 14 calendar days prior to approval.

S. REPORTS:

1. **Daily Logs:** In conjunction with the contractor's daily report, Contractor shall furnish a daily report for each day from the date of Notice to Proceed until Final Acceptance, including those days that no work is performed. The report shall have attached there to a copy of inspections conducted by the VA, a list of all employees on site that day, however, this does not relieve the Contractor of the responsibility to conduct and report inspections. Daily reports shall be submitted on Form VAF 10-6131, "Daily Log" and hand delivered to the COTR by 9:00 AM the following duty day.
2. **Payrolls:** Contractor shall submit two (2) copies of certified payrolls required by VAAR 852.236-85 - Supplementary Labor Standard Provision. Payrolls shall be submitted to the Contracting Officer no later than Wednesday for the previous week.
3. **Payment Requests:** Monthly payment requests from the contractor will not be processed unless all paperwork is current, including daily reports, asbestos reports, and certified payrolls for the prime and all subs.
4. **Requests for Information and/or Clarification:** All RFI's and RFC's shall be submitted to the Contracting Officer to ensure timely response. The Government will answer RFI's and RFC's within twenty-one (21) calendar days from acceptance from the contractor.
5. **Submittal Log:** The contractor shall utilize the specifications and drawings to prepare and provide a submittal log. The Submittal Log shall list all submittals by specification section, paragraph and drawing numbers from the beginning to the end of the documents. The Submittal Log shall be provided to the COTR and Contracting Officer within ten (10) calendar days after receipt of Notice To Proceed. The Government may require additional submittals at its discretion at no additional cost. All submittals shall be approved, by the Contracting Officer prior to beginning related work.

T. **Material Safety Data Sheets (MSDS's):** Contractor shall provide five (5) **GREEN** Loose-leaf binders, permanently labeled "MSDS Sheet for Project ..." with copies of each Material Safety Data Sheets for each and every product, chemical, and other required materials to be used on this project.

1. All instructions for use shall be compiled with.

2. Products will not be used until MSDS's are submitted to the COTR.

These shall be provided for any material no later than the day before those materials arrive on VA property.

3. The contractor shall maintain a current binder on the job site at all times, readily available for viewing by the COTR, Contracting Officer, or Safety Officer.

4. At no time shall the Contractor have, or permit the sub-contractors to have, materials on VA property/station without MSDS sheets.

U. **FIRE RETARDANT MATERIALS:** All materials used on this project, including temporary barriers, plywood, poly, and other required materials shall be fire retardant. All poly shall be 6 mil. minimum. The semi-permanent construction barriers shall be smoke tight.

V. **SMOKE FREE FACILITY:** The James A. Haley VA Hospital is a **SMOKE FREE** facility. There is **NO SMOKING** allowed in any interior or exterior spaces, including all Mechanical Spaces and roofs. Smoking is only permitted in designated exterior smoking areas.

1.7 ALTERATIONS

A. **Survey:** Before any work is started, the Contractor shall make a thorough survey with the COTR and Contracting Officer of buildings, grounds, areas of buildings and grounds in which alterations occur, and areas which are anticipated routes of access. The contractor shall furnish a report, signed by all three, which lists any deficiencies noted at that time. This report shall be approved by the VA prior to the start of any work. The inspection shall include a 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(s) and grounds.

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(s).
 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, COTR and Contracting Officer.
- B. **Relocated Items:** Any items required by drawings to be either reused or relocated or both, found during this survey to be nonexistent, or in opinion of the COTR and Contracting Officer, to be in such condition that their use is impossible or impractical, shall be furnished and/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 clause entitled "DIFFERING SITE CONDITIONS" (FAR 52.236-2) and "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).
- C. **Re-Survey:** Thirty (30) calendar days before expected partial or final inspection date, the Contractor, COTR and Contracting Officer 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 roofs, 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.
4. Once the contractor is notified by the VA of problems or damage to VA property, the contractor shall take immediate corrective action to protect and restore said property. During normal duty hours, corrective action shall be initiated within two (2) hours. After normal duty hours, corrective action shall be initiated within four (4) hours. The Daily Log for that day shall explain the problem(s) and corrective action(s) taken.
5. Dampen debris to keep down dust and provide temporary construction, dust-proof, asbestos containment, smoke rated, and/or fire rated barriers where specified, where indicated on the drawings, and as directed by the COTR. Access doors in barriers shall be hinged and secured with locks. Walk-off mats shall be provided at all access doors.
6. Block off all ducts and diffusers to prevent circulation of dust into occupied areas during construction. Provide Negative Air Machines as specified, to maintain negative pressure within the construction area(s).
7. The contractor shall not allow trash and debris to accumulate on the job site. As a minimum, trash and debris shall be removed once daily, with no flammable materials or trash left on the construction site overnight. All debris shall be removed from the job site in a closed container and disposed of in a proper manner.

1.8 INFECTION PREVENTION MEASURES

- A. Contractor's shall review Hospital Policy Memorandum (HPM) No. 138-24 "Infection Control During Construction and Renovation" dated November 1, 2008 and comply as outlined in this policy. Certain portions of the work will be confined to evenings, and/or weekends, as identified on the drawings or in the specification sections. This HPM and others, either current or when updated, work in conjunction with this article. Work for this project has been deemed to be Type D, and requires CLASS IV precautions under HPM 138-24.
- B. 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.

- C. 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 and as specified here. Prior to start of work, prepare a plan detailing project-specific dust protection measures, including periodic status reports, and submit to the COTR and Contracting Officer 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.

- D. 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 COTR, Contracting Officer 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.

- E. 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 COTR and Contracting Officer. 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 COTR and Contracting Officer. 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, smoke tight, one-hour and/or two-hour fire-rated temporary drywall construction barriers, as required, 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 COTR, Contracting Officer and Medical Center.
- b. HEPA filtration is required where the exhaust dust may reenter the breathing zone. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. Install HEPA (High Efficiency Particulate Accumulator) filter vacuum system rated at 98% 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 pre-filter 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 610mm x 914mm (24" x 36"), shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
- d. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as they are created. Transport these outside the construction area in containers with tightly fitting lids.
- e. The contractor shall not haul debris through patient-care areas without prior approval of the COTR, Contracting Officer 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 twelve (12) hours. Remove and dispose of porous materials that remain damp for more than seventy-two (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.

F. Final Cleanup:

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

1.9 DISPOSAL AND RETENTION

A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows and/or in accordance with Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT:

- 1. Reserved items which are to remain property of the Government are identified by attached tags or noted on drawings and/or in specifications as items to be stored. The COTR and Contracting Officer may also designate items to remain the property of the Government. Items that remain property of the Government shall be removed or dislodged from present locations in such a manner as to prevent damage which would be detrimental to re-installation and

reuse. Store such items where directed by COTR and Contracting Officer.

2. Items not reserved shall become property of the Contractor and be removed by Contractor from the Medical Center, or taken to the Engineering Shop area by the contractor on a case-by-case basis as directed by the COTR.
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.
4. During above ceiling work, the contractor will have to clear rooms, protect VA property and finishes, and move furnishings as necessary to protect the area and items from dust and debris, in the performance of the work above the ceiling.
5. **PCB Transformers, PCB Capacitors and Other Hazardous Waste:** The Contractor shall be responsible for disposal of the Polychlorinated Biphenyl (PCB) transformers and capacitors and other Hazardous Waste. The transformers and capacitors and other Hazardous Waste shall be taken out of service and handled in accordance with the procedures of the Environmental Protection Agency (EPA) and the Department of Transportation (DOT) as outlined in Code of Federal Regulation (CFR), Titled 40 and 49 respectively. The EPA's Toxic Substance Control Act (TSCA) Compliance Program Policy Nos. 6-PCB-6 and 6-PCB-7 also apply. Upon removal of PCB transformers and capacitors and other Hazardous Waste for disposal, the "originator" copy of the Uniform Hazardous Waste Manifest (EPA Form 8700-22), along with the Uniform Hazardous Waste Manifest Continuation Sheet (EPA Form 8700-22A) shall be returned to the Contracting Officer who will annotate the contract file and transmit the Manifest to the Medical Center's COTR and Contracting Officer.
 - a. Copies of the following listed CFR titles may be obtained from the Government Printing Office:
 - 40 CFR 261.....Identification and Listing of Hazardous Waste
 - 40 CFR 262.....Standards Applicable to Generators of Hazardous Waste

40 CFR 263.....Standards Applicable to Transporters of
Hazardous Waste

40 CFR 761.....PCB Manufacturing, Processing, Distribution in
Commerce, and use Prohibitions

49 CFR 172.....Hazardous Material tables and Hazardous
Material Communications Regulations

49 CFR 173.....Shippers - General Requirements for Shipments
and Packaging

49 CFR 173.....Subpart A General

49 CFR 173.....Subpart B Preparation of Hazardous Material for
Transportation

49 CFR 173.....Subpart J Other Regulated Material; Definitions
and Preparation

TSCA.....Compliance Program Policy Nos. 6-PCB-6 and
6-PCB-7

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 sites, 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 Contracting Officer. The contractor shall replace, at their own expense, items damaged to the satisfaction of the COTR and Contracting Officer.
- 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

Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

- C. Contractor shall take all measures and provide all materials necessary for protecting and preserving existing equipment and property in affected areas of construction against dust, debris and physical damage, so that equipment and affected areas to be used in Medical Center operations will not be hindered. Contractor shall permit access to VA personnel through construction areas as required for maintenance and normal Medical Center operations.
- D. When the construction area is turned over to Contractor, Contractor shall accept entire responsibility there-of. Contractor shall maintain in operating condition, existing fire protection, exit light circuits, alarm equipment, and other operational originating in, or passing through the construction area. **IT IS VERY IMPORTANT ESSENTIAL AND LIFE SAFETY SYSTEMS BE CONTINUOUSLY MAINTAINED AND NOT INTERRUPTED WITHOUT TWENTY-ONE (21) CALENDAR DAYS PRIOR WRITTEN NOTICE TO THE MEDICAL CENTER.**
- E. Items of equipment and furnishings located in rooms in which work is to be done under this contract shall remain the property of the Government. During the alteration period when rooms and space are vacated by Veterans' Affairs, such items which are not required by drawings and specifications to be either relocated or reused, will be removed or protected by the Contractor as directed by the COTR.
- F. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Article 1.7, "Alterations", Article 1.11, "Restoration", and Article 1.6, "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.
- G. Refer to FAR clause 52.236-7, "Permits and Responsibilities." A National Pollutant Discharge Elimination System (NPDES) permit is required for projects when the disturbed area on the site one acre or more. The Contractor is considered an "operator" under the permit and has extensive responsibility for compliance with permit requirements. VA will make the permit application available at the (appropriate medical center) office. The apparent low bidder, contractor and affected subcontractors shall furnish all information and certifications that are required to comply with the permit process and permit requirements. Many of the permit requirements will be satisfied

by completing construction as shown and specified. Some requirements involve the Contractor's method of operations and operations planning and the Contractor is responsible for employing best management practices. The affected activities often include, but are not limited to the following:

- Designating areas for equipment maintenance and repair;
- Providing waste receptacles at convenient locations and provide regular collection of wastes;
- Locating equipment wash down areas on site, and provide appropriate control of wash-waters;
- Providing protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials; and
- Providing adequately maintained sanitary facilities.

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 COTR and Contracting Officer. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COTR and Contracting Officer before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.
- B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.
- C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.
- D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to

contract time and price in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2).

1.12 PHYSICAL DATA

- A. Data and information furnished or referred to below, in the contract specification sections, on the contract drawings, and/or in other VA furnished documentation 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. The contractor shall be responsible for conducting a thorough site investigation, before bidding, to satisfy themselves as to actual conditions.
- B. Government does not guarantee that other materials will not be encountered nor that proportions, conditions or character of several materials will not vary from those indicated by explorations and investigations. Bidders are expected to examine site of work; and, after investigation, decide for themselves character of materials and make their bids accordingly. Upon proper application to Department of Veterans Affairs, bidders will be permitted to make explorations or site investigations of their own at the work sites.

1.13 PROFESSIONAL SURVEYING SERVICES

A registered professional land surveyor or registered civil engineer whose services are retained and paid for by the Contractor shall perform services specified herein and in other specification sections. The Contractor shall certify that the land surveyor or civil engineer is not one who is a regular employee of the Contractor, and that the land surveyor or civil engineer has no financial interest in this contract.

1.14 LAYOUT OF WORK

- A. The Contractor shall lay out the work from Government established base lines and bench marks, indicated on the drawings, and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at Contractor's own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the COTR and Contracting Officer. The Contractor shall also be responsible for maintaining and preserving all stakes and other

established marks, until authorized to remove them by the COTR and Contracting Officer. If such marks are destroyed by the Contractor or through Contractor's negligence before their removal is authorized, the Contracting Officer may replace them and deduct the expense of the replacement from any amounts due or to become due to the Contractor.

- B. Establish and plainly mark center lines for each building and/or addition to each existing building, and such other lines and grades that are reasonably necessary to properly assure that location, orientation, and elevations established for each such structure and/or addition, are in accordance with lines and elevations shown on contract drawings.
- C. Following completion of general demolition and before any other permanent work is performed, establish and plainly mark, through use of appropriate other means, sufficient additional survey control points or system of points as may be necessary to assure proper alignment, orientation, and elevations of all major features of work. Survey shall include, but not be limited to, location of exterior walls, center lines of columns in directions, major utilities and elevations of floor slabs:
 - 1. Such additional survey control points or system of points thus established shall be checked and certified by a registered civil engineer. Furnish such certification to the VA COTR and Contracting Officer before any work (such as footings, floor slabs, columns, walls, utilities and other major controlling features) is placed.
- D. The Contractor shall perform the surveying and layout work of this and other articles and specifications in accordance with the provisions of Article 1.13, "Professional Surveying Services".

1.15 AS-BUILT DRAWINGS

- A. The contractor shall maintain two (2) full size sets of as-built (working) 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. Additional sketches will be required where original detail is changed, site conditions differ, and where required to clarify mark-ups. To insure compliance, as-built drawings shall be made available for the COTR and Contracting Officer's review, as often as requested.

- C. Contractor shall deliver two (2) approved completed sets of as-built drawings to the COTR and Contracting Officer within **fifteen (15) calendar days** after each completed phase of the project by the COTR and Contracting Officer.
- D. Upon completion of the project and before final settlement, Contractor shall deliver two (2) approved completed detailed sets of as-built drawings to the COTR and Contracting Officer within **fifteen (15) calendar days**. These drawings shall be in the latest edition of AutoCAD, unless otherwise approved by the COTR and Contracting Officer; the Medical Center currently utilizes AutoCAD Building Systems 2008. These drawings shall show sizes, materials, connections to existing structures, utilities, building service equipment, circuits, electrical conduit and junction box locations and routes, and other required information.
- E. Paragraphs A, B, C & D shall also apply to ALL shop drawings and Installation drawings provided by equipment suppliers and vendors.
- F. Charts, Graphs and Other Information: Provide four (4) copies of all valve locations for plumbing, mechanical & medical gas valve locations. One chart shall be mounted in the mechanical room location as directed by the COTR. Chart shall be plastic laminate or in suitable picture frame.

1.16 USE OF ROADWAYS, PARKING LOTS AND GROUNDS

- A. For hauling, use only established public roads. For hauling, use Roads, Parking Lots and Grounds, and such temporary roads which are necessary in the performance of contract work on Medical Center property, when authorized by the COTR and Contracting Officer. 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.
- B. When new permanent roads are to be a part of this contract, Contractor may construct them immediately for use to facilitate building operations. These roads may be used by all who have business thereon within zone of building operations.
- C. When certain buildings (or parts of certain buildings) are required to be completed in advance of general date of completion, all roads leading thereto must be completed and available for use at time set for completion of such buildings or parts thereof.
- D. To minimize interference of construction activities with the flow of Medical Center Traffic and Parking, comply with the following:

1. Keep roads, walks, entrances to grounds, parking, and occupied areas of buildings, clear of all construction materials, debris, vehicles, and standing equipment.
2. The Warehouse Supervisor shall approve all loading and unloading, and material movements at the north docks.
3. There are NOT any Contractor designated general parking areas.
4. Methods and scheduling for the cutting, altering, removal and/or blockage of existing roads, walks, entrances, parking lots and grounds must be approved by the COTR and Contracting Officer prior to any work.
5. The Contractor shall submit a request to interrupt any roadway, parking lot, or loading dock to the Contracting Officer, in writing, **twenty-one (21) calendar days in advance** of any proposed interruption. The request shall state the reason, areas to be affected, date, exact time of, and approximate duration of such interruption.

1.17 COTR AND CONTRACTING OFFICER FIELD OFFICES

- A. The Contracting Officer's field office is physically located north of the Main Campus/Facility in Building #42. The physical address of the Contracting Section (90C) is Suite 525, located at 8875 Hidden River Parkway, Tampa, FL 33637-1035.
- B. The COTR's field office is physically located north of the Main Campus/Facility in Building #42. The physical address of Facilities Management Services, Project Section (138P) is Suite 202, located at 2702 East 131 Avenue, Tampa, FL 33612.

1.18 TEMPORARY USE OF MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Use of new installed mechanical and electrical equipment to provide heat, ventilation, plumbing, light and power will be permitted subject to compliance with the following provisions:
 1. Permission to use each unit or system must be given in writing by the COTR and Contracting Officer. If the equipment is not installed and maintained in accordance with the following provisions, the COTR and Contracting Officer will withdraw permission for use of the equipment.
 2. Electrical installations used by the equipment shall be completed in accordance with the drawings and specifications to prevent damage to the equipment and the electrical systems, i.e. transformers, relays, circuit breakers, fuses, conductors, motor controllers and their

overload elements shall be properly sized, coordinated and adjusted. Voltage supplied to each item of equipment shall be verified to be correct and it shall be determined that motors are not overloaded. The electrical equipment shall be thoroughly cleaned before using it and again immediately before final inspection including vacuum cleaning and wiping clean interior and exterior surfaces.

3. Units shall be properly lubricated, balanced, and aligned. Vibrations must be eliminated.
 4. Automatic temperature control systems for preheat coils shall function properly and all safety controls shall function to prevent coil freeze-up damage. ALL controls for the equipment shall be functioning properly to prevent damage to the equipment.
 5. The air filtering system utilized shall be that which is designed for the system when complete, and all filter elements shall be replaced periodically during construction and at completion of construction and prior to testing and balancing of system.
 6. All components of equipment and distribution systems 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. Equipment and distribution systems must be operated as a complete system and be fully maintained by operating personnel.
- B. Prior to final inspection, the equipment or parts used, which show wear and tear beyond normal, shall be replaced with identical replacements at no additional cost to the Government.
- C. This paragraph shall not reduce the requirements of the mechanical and electrical specifications sections.

1.19 TEMPORARY USE OF EXISTING ELEVATORS

- A. Contractor will not be allowed the use of existing Medical Center elevators for handling building materials and equipment and personnel, unless approved in writing by the COTR and Contracting Officer. Outside type hoist, crane, and/or elevator shall be used by Contractor for transporting materials and equipment and personnel.
- B. Use of existing Medical Center elevators for handling building materials, equipment and Contractor's personnel will be permitted subject to following provisions:

1. Contractor makes all arrangements with the COTR and Contracting Officer for use of elevators. The COTR and Contracting Officer will ascertain that elevators are in proper condition. The Contractor may, if approved by the COTR and the Contracting Officer, have exclusive use or daily use of the designated elevator(s), except for Facilities Maintenance & Operations. Personnel for operating elevators will not be provided by the Department of Veterans Affairs.
2. Contractor covers and provides maximum protection of following elevator components:
 - a. Entrance jambs, heads soffits and threshold plates.
 - b. Entrance columns, canopy, return panels and inside surfaces of car enclosure walls.
 - c. Finish flooring.
 - d. All other components.
3. When under exclusive use: Government will accept hoisting ropes of elevator and rope of each speed governor (or appropriate elevator lifting mechanisms) if they are worn under normal operation. However, if these ropes (or appropriate elevator lifting mechanisms) are damaged by action of foreign matter such as sand, lime, grit, stones, etc., during temporary use, they shall be removed and replaced by new hoisting ropes (or appropriate elevator lifting mechanisms).
4. When under exclusive use: If brake lining (or appropriate elevator braking mechanisms) of elevators are excessively worn or damaged during temporary use, they shall be removed and replaced by new brake lining (or appropriate elevator braking mechanisms).
5. When under exclusive use: All parts of main controller, starter, relay panel, selector, etc., worn or damaged during temporary use shall be removed and replaced with new parts, if recommended by elevator inspector after elevator is released by Contractor.
6. Place elevator in condition equal, less normal wear, to that existing at time it was placed in service of Contractor as approved by Contracting Officer.

1.20 TEMPORARY TOILETS

- A. Provide where directed, (for use of all Contractor's workmen) ample temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by the COTR and Contracting Officer,

provide suitable dry closets where directed. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of contract, and premises left perfectly clean.

- B. Contractor may have for use of Contractor's workmen, such toilet accommodations as may be assigned to Contractor by the Medical Center's COTR and Contracting Officer. 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.

1.21 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 utility services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.
- B. **Temporary Utilities:** The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of electricity used for the purpose of determining charges. Before final acceptance of the work and unless otherwise directed by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.
- C. **Meters:** Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity and other utilities 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 the Medical Center heating distribution system.
 - a. Steam is available at no cost to Contractor. The Contractor may connect to existing systems at their own expense.

- 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 the COTR and Contracting Officer discretion) of use of water from the 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 the COTR and Contracting Officer discretion), of use of steam from the Medical Center's system.
- H. **Fuel**: Natural gas, LP gas and/or burner fuel oil required for boiler cleaning, normal initial boiler-burner setup and adjusting, and for performing the specified boiler tests will be furnished by the Government. Fuel required for prolonged boiler-burner setup, adjustments, or modifications due to improper design or operation of boiler, burner, or control devices shall be furnished by the Contractor at Contractor's expense.
- I. **Sewer**: Furnish temporary sewer service.
1. Sewer/sanitary waste service may be obtained (site dependent) by connecting to the Medical Center sewer/sanitary waste distribution system. Provide backflow preventer at each connection as required. Provide cleanouts at each connection. Sewer 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 the COTR and Contracting Officer discretion) of use of sewer/sanitary waste from the Medical Center's system.

3. Contractor may need to obtain a storage tank for sewer services and have it pumped out as necessary, at their own expense.

J. **Connections:** ALL connections to and disconnections from existing utility services shall be coordinated per this specification section. Refer to Article 1.6 OPERATIONS AND STORAGE AREAS, paragraphs for Utility Services, Existing Utility Services, Abandoned Lines and others.

1.22 NEW TELEPHONE EQUIPMENT

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

1.23 TESTS / COMMISSIONING

- 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. A copy of the testing agency field reports shall be submitted with the Daily Log report for the day the testing was conducted.
- B. Conduct final tests required in various sections of specifications in presence of the COTR and/or an authorized representative of the Contracting Officer. Contractor shall furnish all labor, materials, equipment, instruments, and forms, to conduct and record such tests. A copy of the testing agency field reports shall be submitted with the Daily Log report for the day the testing was conducted.
- 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, feed-water, 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 results of any component, where required, will only be accepted when submitted with the test results of related components and of the entire system.

1.24 INSTRUCTIONS

- A. Contractor shall furnish Maintenance and Operating manuals, verbal instructions, video instructions, and computer based instructions when required by the various sections of the specifications and as hereinafter specified.
- B. **Manuals:** Provide Maintenance and Operating manuals (**three [3] copies each**) for each separate piece of equipment and system shall be delivered to the COTR and Contracting Officer coincidental with the delivery of the equipment to the job site. Manuals shall be complete, detailed guides for the maintenance and operation of equipment and system. They shall include complete information necessary for starting, adjusting, programming, 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. Manuals shall include all wiring diagrams, pipe and tubing diagrams, programming instructions, and other required information to completely maintain and operate each piece of equipment and system. 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: Provide **four (4) hours of training, two (2) hour sessions [unless otherwise scheduled by the COTR and Contracting Officer]**, for VA Maintenance and Operations personnel for each piece of equipment, each component piece of the equipment, and each system. 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 and system. All such training will be at the job site. These requirements are more specifically detailed in the various technical sections. Instructions for different items of equipment that are component parts of a complete system, shall be given in an integrated, progressive manner. All instructors for every piece of component equipment in a system shall be available until instructions for all items included in the system have been completed. This is to assure proper instruction in the operation of inter-related systems. All instruction periods shall be at such times as scheduled by the COTR, the Contracting Officer, and the M&O Supervisor, and shall be considered concluded only when the COTR, the Contracting Officer, and the M&O Supervisor, are 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 COTR and Contracting Officer, does not demonstrate sufficient qualifications in accordance with requirements for instructors above. Training sessions may be recorded by the VA.

1.25 GOVERNMENT-FURNISHED PROPERTY

- A. The Government shall deliver to the Contractor, the Government-furnished property shown on the Schedules and/or drawings.
- B. Equipment furnished by Government to be installed by Contractor will be furnished to Contractor at the Medical Center.
- C. Contractor shall be prepared to receive this equipment from Government and store or place such equipment, as required, not less than 90 calendar days before Completion Date of project.
- D. Storage space for some, but not all, equipment may 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. Coordination with the COTR and the Contracting Officer is required.
- E. Notify Contracting Officer in writing, 60 calendar 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.

F. 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.

G. Completely assemble and install the Government furnished equipment in place ready for proper operation in accordance with specifications and drawings.

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

1.26 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 on the drawings to be relocated by the Contractor.

B. Perform relocation of such equipment or items at such times and in such a manner as indicated in the drawings and specifications and/or as directed by the COTR and Contracting Officer.

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 1.6.O, "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 disassembly, assembly and installation of existing equipment and items, 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.

1.27 STORAGE SPACE FOR DEPARTMENT OF VETERANS AFFAIRS EQUIPMENT

- A. Contractor shall complete areas and/or rooms to be renovated and coordinate with the COTR and Contracting Officer the use of elevators and areas/rooms for storage of certain materials and equipment by Department of Veterans Affairs.

1.28 CONSTRUCTION SIGN

- A. Provide a Construction Sign where directed by the COTR and Contracting Officer. All wood members shall be of framing lumber. Cover sign frame with 0.7 mm (24 gage) galvanized sheet steel nailed securely around edges and on all bearings. Provide three 102 x 102 mm (4 inch x 4 inch) posts (or equivalent round posts) set 1219 mm (four feet) into ground. Set bottom of sign level at 914 mm (three feet) above ground and secure to posts with through bolts. Make posts full height of sign. Brace posts with 51 x 102 mm (two x four inch) material as directed.
- B. Paint all surfaces of sign and posts two coats of white gloss paint. Border and letters shall be of black gloss paint, except project title which shall be blue gloss paint.
- C. Maintain signs and remove when directed by the COTR and Contracting Officer.
- D. Provide a Detail Drawing of construction sign showing required legend and other characteristics of sign to the COTR and Contracting Officer for approval. Upon written approval, the contractor will construct and install the construction sign.
- E. Provide two (2) construction signs at each entrance to the construction areas. Signs shall be constructed of a durable material, twelve (12) inches

high and thirty (30) inches wide with yellow background and blue Helvetica lettering two (2) inches high. Letter as shown in the following:

DANGER - KEEP OUT

CONSTRUCTION AREA

AUTHORIZED PERSONNEL ONLY

**EXCUSE THE INCONVENIENCE
WE ARE WORKING TO IMPROVE YOUR FACILITY**

1.29 SAFETY SIGN

- A. Provide a Safety Sign where directed by COTR and Contracting Officer. Face of sign shall be 19 mm (3/4 inch) thick exterior grade plywood. Provide two 102 mm x 102 mm (four x four inch) posts extending full height of sign and 914 mm (three feet) into ground. Set bottom of sign level at 1219 mm (four feet) above ground.
- B. Paint all surfaces of Safety Sign and posts with one prime coat and two coats of white gloss paint. Letters and design shall be painted with gloss paint of colors noted.
- C. Maintain signs and remove when directed by COTR and Contracting Officer.
- D. Provide a Detail Drawing of construction sign showing required legend and other characteristics of sign to the COTR and Contracting Officer for approval. Upon written approval, the contractor will construct and install the construction sign.
- E. Post the number of accident free days on a daily basis.
- F. Provide all OSHA required Safety Signs where required by OSHA and where directed by COTR and Contracting Officer. These shall be commercially produced.

1.30 CONSTRUCTION DIGITAL IMAGES

- A. Prior to and During the construction period through completion, furnish Department of Veterans Affairs with 50 views of digital images, including one color print of each view and one Compact Disc (CD) per visit containing those views taken on that visit. Digital views shall be taken of exterior and/or interior as selected and directed by COTR and Contracting Officer. Each view shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) and the images will be a minimum of 2272 x 1704 pixels for the 203 x 254 mm (8 x 10 inch)

prints and 2592 x 1944 pixels for the 406 x 508 mm (16 x 20 inch) prints, as per these specifications:

1. Images will be taken at monthly intervals. However, the VA COTR and Contracting Officer may also direct the taking of special digital images at any time prior to completion and acceptance of contract. If the number of trips to the site exceeds an average of one per month of the contract performance period then an adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).
 2. In event a greater or lesser number of images than specified above are required by the COTR and Contracting Officer, adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88).
- B. Images shall be taken by a commercial photographer and must show distinctly, at as large a scale as possible, all parts of work embraced in the picture.
- C. Prints shall be made on 203 x 254 mm (8 x 10 inch) regular-weight matte archival grade photographic paper and produced by a process with a minimum of 300 pixels per inch (PPI). Prints must be printed using the commercial RA4 process (inkjet prints will not be acceptable). Photographs shall have 203 x 203 mm (8 x 8 inch) full picture print with no margin on three sides and a 51 mm (2 inches) margin on the bottom for pre-typed self-adhesive identity label to be added by the COTR and Contracting Officer. It is required that the prints are professionally processed so the quality will meet or exceed that of the same size print made with a film camera. Prints must be shipped flat to the field offices of the COTR and Contracting Officer.
- D. Images on CD-ROM shall be recorded in JPEG format with a minimum of 24 bit color and no reduction in actual picture size. Compressed size of the file shall be no less than 80% or the original with no loss of information. File names shall contain the date the image was taken, the Project number and a unique sequential identifier. The CD-ROM shall also contain an index of all the images contained therein in either a TXT or Microsoft Word format.
- E. In case any set of prints are not submitted within five calendar days of the date established by the COTR and Contracting Officer for taking thereof, the COTR and Contracting Officer may have such

images/photographs taken and cost of same will be deducted from any money due to the Contractor.

1.31 FINAL ELEVATION DIGITAL IMAGES

- A. A minimum of four (4) images of each elevation shall be taken with a minimum 6 MP camera, by a professional photographer with different settings to allow the COTR and Contracting Officer to select the image to be printed. All images are provided to the COTR and Contracting Officer on a CD.
- B. Photographs shall be taken upon completion, including landscaping. They shall be taken on a clear sunny day to obtain sufficient detail to show depth and to provide clear, sharp pictures. Pictures shall be 406 mm x 508 mm (16 x 20 inches), printed on regular weight paper, matte finish archival grade photographic paper and produced by a RA4 process from the digital image with a minimum 300 PPI. Identifying data shall be carried on label affixed to back of photograph without damage to photograph and shall be similar to that provided for final construction photographs.

1.32 HISTORIC PRESERVATION

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 COTR and Contracting Officer verbally, and then with a written follow up.

1.33 EQUIPMENT

- A. The contractor shall coordinate the installation of equipment with work performed by others. This work shall be completed before the building is turned over to VA.
- B. All required programming devices, specialty tools, start-up supplies, one (1) additional set of belts - fuses - etc. per each piece of equipment and other items required by the specification sections and drawings shall be furnished.

1.34 FINAL PAYMENT

- A. Final payment under this contract shall be withheld pending receipt of ALL tests, close out documents, all equipment manuals, staff training, specialty tools, start-up supplies, as built drawings and certifications. These tests and certifications shall include: sprinkler certification, fire alarm certification, plumbing system leak tests - to include hot - cold - waste - vents, medical gas certifications, fire/smoke wall

certification, vibration analysis of motor driven equipment, motor - shaft - base - pulley alignment certifications, HVAC TAB, Air Handler control demonstration/training of VA personnel, and other required information, and the return of all keys

1.35 WARRANTY CALLS

- A. The Government may contact the contractor for warranty services by telephone, fax, e-mail, letter or in person. The Contractor shall respond with actual physical repair activity (labor, equipment, materials, etc.) within three (3) business days of a routine warranty call, within eight (8) hours for emergencies. Please note that emergency calls may occur during other than normal work hours. A representative from the Facilities Management Service will identify the emergency calls.

1.36 ATTACHMENTS

A. Appendices:

1. **Appendix A** - Approved OSHA Training Providers List
2. **Appendix B** - VA Adopted Codes
3. **Appendix C** - Proper Procedures and Forms for all Utility Shutdowns and Live Electrical Work

B. Forms:

1. **Attachment 1 A / B** - Notification of Impaired Fire Protection by Contractor Personnel
2. **Attachment 2** - Notification of Hot Work Operations by Contractor Personnel (Burn Permit)
3. **Attachment 3** - Hot Work Fire Safety Check List for Operations Area Inspection
4. **Attachment 4** - Construction Fire Safety Check List
5. **Attachment 5** - Notification of M & R Work

C. Hospital Policy Memoranda

1. **HPM 138-15** - Interim Life Safety Measures (ILSM)
2. **HPM 138-24** - Infection Control During Construction and Renovation (ICRA)

- - - E N D - - -

Appendix A

Approved OSHA Training Providers List

Current List of Approved Outreach On-line Training Websites:

Construction 10 hour

1. Bright Brains/AdvanceOnline - www.advanceonline.com and hosted through:
 - Region X OSHA Training Institute Education Center: www.regionxoti.org
 - AGC: <http://agc.advanceonline.com>
 - JJ Keller: www.keller-itc.com
2. ClickSafety - www.clicksafety.com and hosted through:
 - Keene State College: www.keene.edu/conted/osha.cfm
3. 360Training - www.oshacampus.com and hosted through:
 - Eastern Kentucky University - <http://eku.360training.com>
 - Metropolitan Community Colleges - <http://mcc.360training.com>
 - Red Rocks Community College - <http://rrcc.360training.com>
 - WESTEC OSHA ED Center - <http://westec.360training.com>

Construction 30 hour

1. Turner Construction -
<https://www.turnerknowledge.com/turner/livelink.exe?func=login.channelpartner>
2. ClickSafety - www.clicksafety.com and hosted through:
 - Keene State College: www.keene.edu/conted/osha.cfm

Appendix B

VA Adopted Codes

GENERAL: VA has adopted the latest editions of the following codes and standards as a minimum for all projects performed in the modernization, alteration, addition, or improvement of its real property and the construction of new structures. VA design Manuals and Master Specifications specify other codes and standards that VA follows on its projects:

- VA Directives, Design Manuals, Master Specifications, VA National CAD Standard Application Guide, and other Guidance on the Technical Information Library (TIL) (<http://www.cfm.va.gov/til/>).
- International Building Code (IBC), including International Mechanical and Plumbing Codes
- NFPA 101, Life Safety Code (see NOTES below)
- NFPA National Fire Codes, with the exception of NFPA 5000 and NFPA 900
- Occupational, Safety and Health Administration (OSHA) Standards.
- VA Seismic Design Requirements, H-18-8
- NFPA 70, National Electrical Code (NEC)
- National Standard Plumbing Code (NSPC)
- Safety Code for Elevators and Escalators, American Society of Mechanical Engineers (ASME) A 17.1.
- ASME Boiler and Pressure Vessel Codes
- ASME Code for Pressure Piping
- Uniform Federal Accessibility Standards (UFAS) including VA Supplement, Barrier Free Design
- Building Code Requirements for Reinforced Concrete, American Concrete Institute and Commentary (ACI 318)
- Manual of Steel Construction, Load and Resistance Factor Design Specifications for Structural Steel Buildings, American Institute of Steel Construction (AISC)
- Energy policy Act of 2005 (EPAct)
- American Society of Heating and Refrigeration Engineers (ASHRAE) 90.1, Energy Standards for Buildings Except Low-Rise Residential Buildings
- Federal Leadership in High Performance and Sustainable Buildings: Memorandum of Understanding (MOU)
- Executive Order 13423: Strengthening Federal Environmental, Energy, and Transportation Management.

- Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance
- The Provisions for Construction and Safety Signs. Stated in the General Requirements, Section 01 00 00, of the VA Construction Specifications.
- America Society of Heating and Refrigeration Engineers (ASHRAE), Ventilation for Acceptable Indoor Air Quality - ASHRAE Standard 62.1
- Safety Standard for Refrigeration Systems - ASHRAE Standard 15

Local Codes: As an agency of the federal government, VA is not subject to local imposition of code enforcement procedures (drawing reviews, building permits, inspections, fees, etc.). VA must function as the Authority Having Jurisdiction (AHJ) and thus has the responsibility to guard public health and safety through enforcing its adopted codes. However, local authorities should be notified about planned projects and given opportunity to review drawings provided that VA does not pay for review or inspection fees.

NOTES:

1. NFPA 101 primarily addresses life safety and fire protection features while the IBC addresses a wide range of considerations, including, but not limited to, structural strength, stability, sanitation, adequate light and ventilation, and energy conservation. VA buildings must meet the requirements of NFPA 101 and documents referenced by NFPA 101 in order to comply with the accreditation requirements of The Joint Commission for the Accreditation of Hospitals. Therefore, designs shall comply with the requirements of the latest edition of NFPA 101 and documents referenced therein. Design features not addressed by NFPA 101 or documents referenced therein shall comply with the requirements of the latest edition of the IBC or as otherwise addressed above in this Program Guide. For design features that are addressed by both the IBC as well as NFPA 101 or a document referenced by NFPA 101, the requirements of NFPA 101 or the document referenced by NFPA 101 shall be used exclusively (this applies even if the IBC requirements are different).

Conflicts between Nationally Recognized Codes and Standards and VA Requirements: Should a conflict exist between VA requirements and VA adopted nationally recognized codes and standards, the conflict shall be brought to the attention of VA. The resolution of the conflict shall be made by the authority having jurisdiction for VA to ensure a consistency system wide.

Appendix C

Proper Procedures and Forms for all Utility Shutdowns and Live Electrical Work

GENERAL NARRATIVE OF DOCUMENTATION REQUIREMENTS FOR PLANNED UTILITY SHUTDOWNS

General: All of the following types of work will be documented by the requesting party (contractor or in-house maintenance person) in a file folder fitted with two-hole prong paper fasteners. Fasteners will be attached to the tops of each cover of the file folder. This narrative should be used in conjunction with the Utility Shutdown Flow Chart for a clear understanding of the shutdown process.

1. Planned Utility Shutdown:

In accordance with Hospital Policy Memorandum No. HPM 138-23, June 2007, a request for a utility shutdown must be presented to the Chief, Facilities Management Service (FMS), for evaluation and action to determine whether the shutdown will be classified as routine or major.

- A. A **Draft Utility Shutdown Notice** is initiated by the requesting party and upon completion will be stapled to the outside front-cover of the file folder.
- B. The **Planned Utility Interruption Checklist** will be attached to the inside front-cover using the two-hole prong fastener.
- C. The **Work Plan / Peer Review** form is initiated and attached to the inside back-cover using the two-hole prong fastener.
- D. All **Supporting Documents** will be attached to the inside back-cover of the file folder in reverse chronological order (most recent on top). These documents include, but are not limited to, (1) any required permits (enclosed space, above ceiling, etc.) and approvals, (2) drawings / sketches of work, (3) meeting minutes, (4) coordination with affected services, (5) Mitigation Plan, (6) Contingency Plan, (7) shutdown procedures, and (8) start-up procedures, or as required by the Approving Official (Chief, FMS).

2. Live Electrical Work:

In accordance with VHA Directive 2006-056, any energized electrical work plan must have the prior knowledge and approval of the Medical Center Director (Exception - The Chief, FMS may approve energized electrical work plans for Branch Circuits, from the final overcurrent protecting devices to

the outlets, that do not serve the critical patient care areas, such as Operating Rooms, Critical Care, Intensive Care, Dialysis Units, Isolation Rooms, Catheterization Laboratories, Emergency Rooms, or Supply, Processing, and Distribution (SPD) rooms).

- A. The **Request to Perform Live Electrical Work** (memo to the Hospital Director) is initiated and upon approval will be attached to the inside back-cover using the two-hole prong fastener.
- B. The **Work Plan / Peer Review** form is initiated and attached to the inside back-cover using the two-hole prong fastener.
- C. All **Supporting Documents** will be attached to the inside back-cover of the file folder in reverse chronological order (most recent on top). These documents include, but are not limited to, (1) any required permits (enclosed space, above ceiling, etc.) and approvals, (2) drawings / sketches of work, (3) meeting minutes, and (4) coordination with affected services.

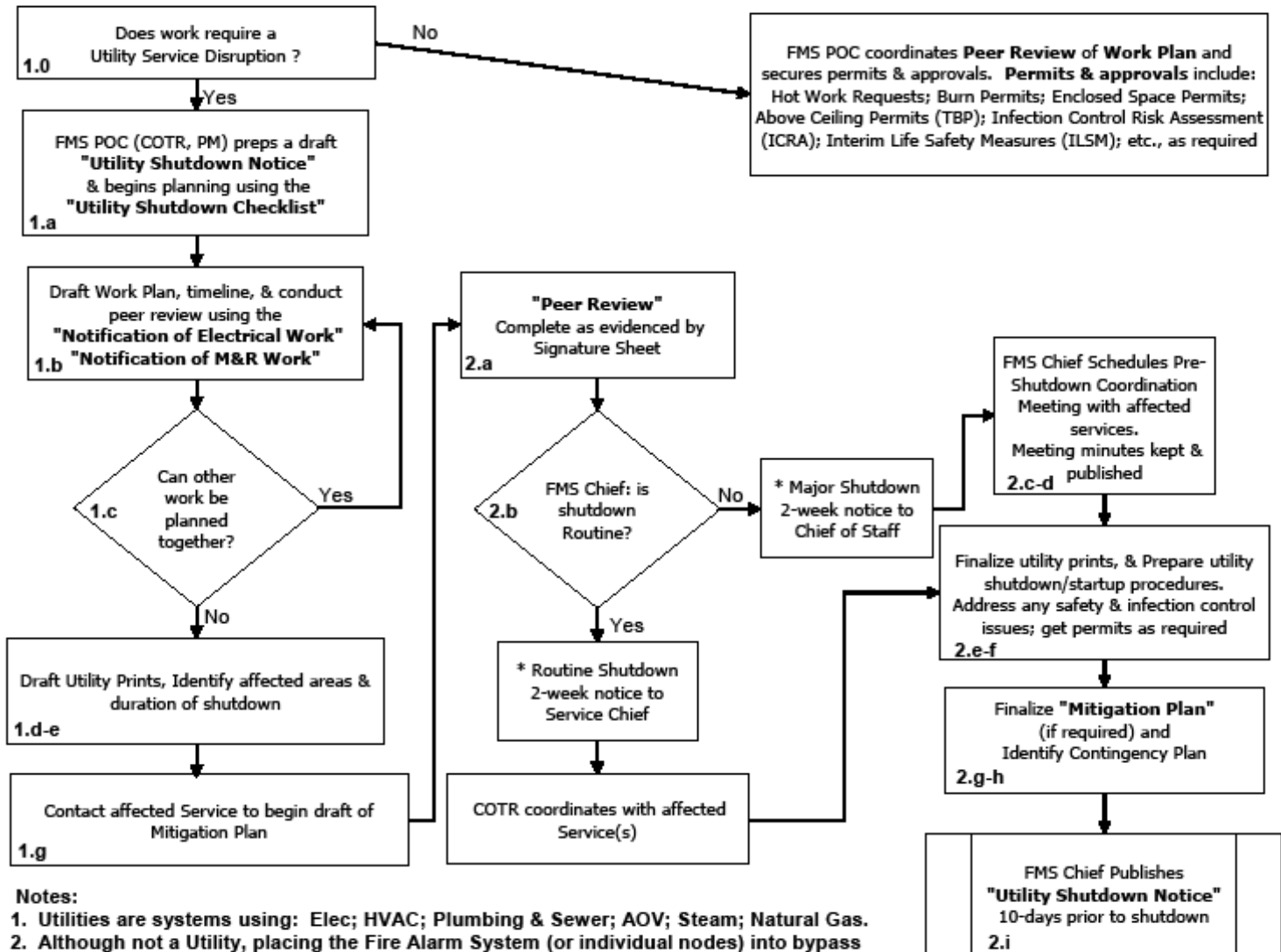
3. Hot Work (Burn):

Facilities Management Service Standard Operating Procedures No. 138-05, August 2009, defines Hot Work as operations which include "... cutting, welding, brazing, silver soldering and other processes that utilize an open flame or arc." Please note that although Live Electrical Work is sometimes referred to in the trade as Hot Work, it is not (within the context of this document) since under normal working conditions it will not result in an open flame or arc.

- A. The **Hot Work (Burn) Permit** is initiated and consists of two documents - the Notification of Hot Work Operations by Contractor Personnel (Burn Permit) and the Hot Work Fire Safety Check List for Operations Area Inspection (Attachments 2 & 3). Upon approval it will be posted at the job site until all work has been completed. After completion of work, the documents will be attached to the inside back-cover of the file folder.
- B. The **Work Plan / Peer Review** form is initiated and attached to the inside back-cover using the two-hole prong fastener.
- C. All **Supporting Documents** will be attached to the inside back-cover of the file folder in reverse chronological order (most recent on top). These documents include, but are not limited to, (1) any required permits (enclosed space, above ceiling, etc.) and approvals, (2) drawings / sketches of work, (3) meeting minutes, and (4) coordination with affected services.

The following flowchart is based on the Planned Utility Interruption Checklist included within Appendix C.

Flowchart - Planned Utility Shutdown



WORK PLAN REQUEST

PROJECT / WORK ORDER No. & TITLE: NRM Project No. 673-09-102, "EP Lab Site Prep"

DATE OF WORK: Sn,M,T,W,Th,F,St **START TIME:** _____ AM/PM

END TIME: _____ AM/PM **ESTIMATED DURATION OF WORK:** _____ HOURS

LOCATION OF WORK:

DESCRIPTION OF WORK:

All maintenance, repair, and construction work must have a written procedure (work plan) prepared by the Contractor / Maintenance person responsible for performing the task. The COTR / Shop Supervisor will coordinate the peer review. This completed form (with supporting documentation) must be forwarded to the Chief, FMS at least 2 ½ weeks before work is planned to begin.

PROCEDURE (S) :

Before: _____

During: _____

After: _____

Attachments: _____ YES _____ NO

NAME(S) OF EMPLOYEE(S) / CONTRACTOR(S) PERFORMING WORK:

CONTRACTOR / WORK LEADER SIGNATURE & DATE: _____

CONTRACTOR / WORK LEADER NAME (PRINTED): _____

PEER REVIEW

PROJECT / WORK ORDER No. & TITLE: NRM Project No. 673-09-102, "EP Lab Site Prep"

<u>Name</u>	<u>Signature</u>	<u>Title / Service</u>	<u>Date</u>
		COTR / FMS	
		Elec Supv / FMS	
		AC Supv / FMS	
		Plumb Supv / FMS	
		Controls / FMS	
		M&O Supv / FMS	
		Chief Project / FMS	
		Chief / FMS	

Check all that apply:

- _____ Notification of Live Electrical Work
- _____ Enclosed Space Permit
- _____ Burn Permit (Hot Work)
- _____ Safety Review (ILSM)
- _____ Infection Controls Review (ICRA)
- _____ Above Ceiling Permit
- _____ Drawings Enclosed
- _____ Mitigation Plan
- _____ Contingency Plan
- _____ Does the work require a Utility Shutdown?
- _____ Is a Shutdown Coordination Meeting Required?
- _____ Utility Shutdown Notice
- _____ Utility Shutdown & Start Up Procedures
- _____ Planned Utility Shutdown Checklist and Flow Chart

PLANNED UTILITY INTERRUPTION CHECKLIST

Project Name: _____ Project # _____

COTR Name: _____ Phone #: (_____) _____

1. Utility Shutdown Request

#	Item	POC	Comments
1.a.	Draft Utility Shutdown Notice	COTR	
1.b.	Work Plan, draft Timeline & Peer review	Contractor / COTR	
1.c.	Other Work Plans (Piggyback work)	M&O / COTR	
1.d.	Utility prints marked with isolation points for valves, equipment	COTR / M&O	
1.e.	Identify affected areas / services	COTR / M&O	
1.f.	Identify duration of shutdown	Contractor / COTR	
1.g.	Draft mitigation plan	COTR / M&O	

2. Planning the Shutdown

#	Item	POC	Comments
2.a.	Peer Review complete	COTR	
2.b.	Chief FMS determines "Routine" or "Major" shutdown	Chief FMS	
2.c.	Coordination meetings as applicable		
2.d.	Coordinate with affected areas & services*	COTR / M&O	
2.e.	Prepare utility shutdown and start-up procedures	M&O Shops	
2.f.	Verify & update prints	COTR	
2.g.	Finalize Utility Mitigation Plan	M&O	
2.h.	Identify Contingency Plan	COTR / M&O	
2.i.	Publish Utility Shutdown Notice	COTR	

*Include respiratory therapy on all AOV-related system modifications.

3. Preparation

#	Item	POC	Comments
3.a.	Tag and mark field verified equipment and locations of valves / breakers, switches, etc that disrupt utilities & hospital services*	M&O	
3.b.	Stage work materials / pre-	Contractor	

	fabricated parts, etc		
3.c	Stage mitigation supplies & services	M&O	
3.d	Shutdown folder to CEP, contents include (as applicable): <ul style="list-style-type: none"> • Final Shutdown Notice • Work Plan with Peer review & Timeline • Mitigation Plan • POC Lists with contact information • Shutdown and Start up procedures 	CEP Supervisor	

*Includes all sources of stored energy and services such as medical gasses.

4. Execution

#	Item	POC	Comments
4.a.	COTR informs CEP to initiate shutdown	COTR	
4.b	CEP initiates shutdown*; equipment is LOTO as planned	CEP	
4.c	Monitor shutdown and informs all parties when utility / service is secure	CEP	
4.d	Tracks progress via the Work Plan Timeline	CEP / COTR	
4.e	Notifies CEP when work is complete	COTR	
4.f	Initiates start up procedures to return the utility to service	CEP	
4.g	Notifies AOD when facility returns to safe state	CEP	

*Contact Repertory Therapy POC whenever AOV-related items are affected.

5. Recovery

#	Item	POC	Comments
5.a	Mitigation measures removed; report completion to CEP	CEP / Shops	
5.b	Update Drawings	COTR	
5.c	File Shutdown Folder	Chief, FMS	

Note: Be sure to include the following on this side of 2-Prong Folder. Some elements may be omitted.

1. Notes from Shutdown Meetings / Coordination
2. Mitigation Plan
3. Contingency Plan
4. Shutdown procedures
5. Work Plan / Peer Review

6. Start up procedures

FACILITIES MANAGEMENT SERVICE - ALERT

Distributed: UTILITY SHUTDOWN NOTICE

UTILITY AREA(S) AFFECTED:	DATE:	ESTIMATED TIME FRAME:
TIME / DURATION:	_____	_____

<i>HOW THIS AFFECTS YOU:</i>
<i>REASON FOR SHUTDOWN:</i>

FMS CONTACT PERSON: Guy Unger, COTR, at ext. 4850, or Cell (813) 610-7460.

If you have any questions or problems with this date, please notify the contact person(s) above by the close of business one day from the date of this publication. After that date, the closure will proceed as described above. Supervisors, please share with all staff.

Ronald R. Stipp
Chief, Facilities Management Service

PLEASE SHARE WITH ALL STAFF

ENERGIZED (LIVE) ELECTRICAL WORK DIRECTOR MEMO

Date:

From: Facilities Management Service (138)

Subject: Request to Perform Live Electrical Work for the NRM Project No. 673-09-102, "EP Lab Site Prep".

To: Director (00)

1. In accordance with VHA Directive 2006-056 an energized electrical work plan must have the prior knowledge, and approval of the Medical Center Director.

Description of the work being performed, and the circuits impacted by this work:

2. The start date for this work is ____ Day ____, ____ Date ____ at ____ Time _____. The estimated duration for this work is _____ hours.
3. Any questions or concerns please call Guy Unger, Project Engineer / COTR, at (813) 972-2000 extension 4850, VA Cell Phone (813) 610-7460, or e-mail: guy.unger@va.gov.

Ronald R. Stipp
Chief, Facilities Management Service

Approve / Disapprove

Stephen M. Lucas, Director (00)

Date

Enclosure: (#)

ATTACHMENT #1 - A

NOTIFICATION OF IMPAIRED FIRE PROTECTION BY CONTRACTOR PERSONNEL

PROJECT No. & TITLE: NRM Project No. 673-09-102, "EP Lab Site Prep"

NAME OF FACILITY

NOTIFIED BY

TITLE _____

COMPANY

NATURE OF IMPAIRMENT

PRECAUTIONS TO BE TAKEN

CLOSED VALVE NO. _____ IN BLDG. NO. _____ LOCATED IN ROOM _____

CONTROLLING _____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

BECAUSE:

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

COTR _____ WAS CONTACTED AT (813) 972-2000

ext. _____ or (813) _____

DATE/TIME SAFETY OFFICER WAS CONTACTED AT EXT. 7598

DATE/TIME EGCC OPERATOR/CEP WAS CONTACTED AT EXT. 7080

DATE/TIME FIRE DEPARTMENT WAS CONTACTED AT (813) 971-3636

DATE/TIME RSFPE WAS CONTACTED AT () _____

ATTACHMENT #1 - B

NOTIFICATION OF RESTORED FIRE PROTECTION BY CONTRACTOR PERSONNEL

PROJECT No. & TITLE: NRM Project No. 673-09-102, "EP Lab Site Prep"

NAME OF FACILITY

NOTIFIED BY

TITLE _____

COMPANY

NATURE OF IMPAIRMENT

AND FULL PROTECTION RESTORED, EXCEPT

OPENED VALVE NO. _____ IN BLDG. NO. _____ LOCATED IN ROOM _____

CONTROLLING _____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

BECAUSE:

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

COTR _____ WAS CONTACTED AT (813) 972-2000

ext. _____ or (813) _____

DATE/TIME SAFETY OFFICER WAS CONTACTED AT EXT. 7598

DATE/TIME EGCC OPERATOR/CEP WAS CONTACTED AT EXT. 7080

DATE/TIME FIRE DEPARTMENT WAS CONTACTED AT (813) 971-3636

DATE/TIME RSFPE WAS CONTACTED AT () _____

ATTACHMENT #2

NOTIFICATION OF HOT WORK OPERATIONS BY CONTRACTOR PERSONNEL (BURN PERMIT)

FOR PROJECT No. & TITLE: NRM Project No. 673-09-102, "EP Lab Site Prep"

NAME OF FACILITY _____

BUILDING No. & NAME: _____

ON FLOORS: _____

ON DATE: Sn,M,T,W,Th,F,St _____ @ TIME _____ AM/PM

WORK TO BE DONE:

SPECIAL PRECAUTIONS:

NAME OF FIRE WATCH PERSON IF APPLICABLE:

COMMENTS:

NOTIFIED BY _____

NOTIFIERS SIGNATURE & DATE _____

TITLE & PHONE No. _____

CONTRACTOR _____

COTR _____

APPROVAL _____

COTR SIGNATURE & DATE _____

SAFETY STAFF MEMBER _____

SAFETY SIGNATURE & DATE _____

ATTACHMENT #3

HOT WORK FIRE SAFETY CHECK LIST FOR OPERATIONS AREA INSPECTION

PROJECT NO. & TITLE: NRM Project No. 673-09-102, "EP Lab Site Prep"

DATE: _____

_____ Floor swept clean of combustibles.
_____ Floors wet down, covered with damp sand, metal or other shields.
_____ Combustibles material or flammable liquids removed from area,
_____ whenever possible.
_____ Combustibles and flammable liquids protected with covers, guards,
_____ or metal shields.
_____ All wall and floor openings covered.
_____ Covers suspended beneath work to collect sparks.

WORK BEING DONE ON WALLS OR CEILINGS

_____ Ensure wall construction is noncombustible and is without
_____ combustible covering.
_____ Move combustibles away from opposite side of wall.

WORK BEING DONE ON ENCLOSED EQUIPMENT-(TANKS, DUCTS, ETC.)

_____ Remove all combustibles from enclosures.
_____ Purge containers of flammable vapors. Ensure continuous purge so
_____ no vapors accumulate during work.

FIRE WATCH

_____ To be provided during and until 30 minutes after operation.
_____ Provided with a 10-pound dry chemical or halon extinguisher and
_____ small hose.
_____ Trained in use of equipment and in sounding fire alarm.

FINAL CHECK-UP

_____ To be made 30 minutes after completion of any operation unless
_____ fire watch is provided.
_____ Notify Safety Office (extension 7292) when work is complete.
_____ (Contractors - notify COTR)
_____ Notify Graphic Control Center (extension 7080), if any fire zones
_____ were by-passed

HOT WORK LOCATION _____

NOTIFIERS SIGNATURE & DATE _____

NAME & PHONE No. _____

CONTRACTOR

COTR SIGNATURE & DATE

ATTACHMENT #4

CONSTRUCTION FIRE SAFETY CHECK LIST

(For protection of VA property, patients, visitors and personnel)

PROJECT # & Title: NRM Project No. 673-09-102, "EP Lab Site Prep"

DATE: _____

A. FIRE EXTINGUISHERS (OSHA 1926.150[c])

- _____ (1) Extinguisher available within 100 feet. Extinguisher rated not less than 2A.
- _____ (2) If flammable liquids or gases present, a fire extinguisher rated not less than 10B within 50 feet.

B. IGNITION HAZARDS (OSHA 1926.1511[a])

- _____ (1) Internal combustion engines located away from combustibles.
- _____ (2) Smoking is prohibited in fire hazard areas (flammables, combustibles).

C. INDOOR STORAGE (OSHA 1926.151[d])

- _____ (1) Site kept free from accumulation of unnecessary combustibles.
- _____ (2) Storage shall not obstruct means of exits.
- _____ (3) Clearance maintained around lights and heating units.

D. FLAMMABLE AND COMBUSTIBLE LIQUIDS (OSHA 1926.152)

- _____ (1) Approved containers.
- _____ (2) No storage in areas of exits, stairways or people traffic areas.
- _____ (3) Max. 25 gal. In room - otherwise approved storage cabinet.

E. TEMPORARY HEATING DEVICES (OSHA 1926.154)

- _____ (1) Adequate ventilation for workmen and heater combustion.
- _____ (2) Clearance of combustibles from heaters at least 3 feet.
- _____ (3) Stability of heater.

F. SIGNS AND BARRICADES (OSHA 1926.200)

- _____ (1) Danger signs where immediate hazards exist.
- _____ (2) Caution signs where potential hazards exist.
- _____ (3) Safety instruction signs where necessary.
- _____ (4) Barricades where necessary to protect persons from hazards.

G. WELDING AND CUTTING - HOT WORK PERMIT REQUIRED (NFPA-51B & OSHA 1910.252)

- _____ (1) Inspection of area before permit given.
- _____ (2) Distance from combustibles 35 feet.
- _____ (3) Fire extinguisher in immediate area.

- _____ (4) Wall and floor openings covered.
- _____ (5) No flammable liquids present.
- _____ (6) Inspection after work.

H. ELECTRICAL (OSHA 1924.400-2, 1926.302, & NFPA 241-4)

- _____ (1) All temporary wiring grounded and in accordance with National Electric Code (NEC).
- _____ (2) Precautions taken to make any open wiring inaccessible to other than authorized personnel.
- _____ (3) Temporary light bulb equipped with guards, use heavy duty cords, and not suspended by their cords unless specifically designed for that use.
- _____ (4) Runs of open conductors located away from possible damage and fastened at intervals of no greater than 10 feet.
- _____ (5) Outlets in construction sites have GFCI or assured equipment grounding.
- _____ (6) Extension cords protected from damage. No worn or frayed cables. Not hung from nails or suspended by wire.
- _____ (7) Fuses or circuit breaker provided for each feeder or branch circuit.
- _____ (8) Electrical powered operated hand tools shall either be of the approved double insulated type or properly grounded.

I. DEMOLITION (OSHA 1926.850-858 and NFPA 241 - Ch.7)

- _____ (1) Electric, gas water, steam, etc. shut off prior to work.
- _____ (2) Any utilities that are necessary to be maintained need protection.
- _____ (3) Masonry walls shall not be permitted to fall on floors such that it would exceed the safe carrying capacity of the floor.
- _____ (4) Floor openings within 10 feet of any wall being demolished shall be planked solid except when no one below.
- _____ (5) The storage of waste material and debris shall not exceed the floor loading limit.
- _____ (6) Construction of dust barriers as needed (not OSHA).
- _____ (7) Notification of shut off and protect smoke detectors, etc. during day time only (not OSHA). Coordinated with COTR.
- _____ (8) Precautions if floors are soaked with oil or flammable liquids, if dust accumulation is present or other combustibles a present and hot work is being performed.
- _____ (9) Smoking is prohibited throughout demolition (NFPA 241, 7-4, 2).
- _____ (10) Flammable and combustible liquids removed from area.
- _____ (11) Water supplies must still be available from fire hydrants in the vicinity of the structure or area.
- _____ (12) Asbestos abatement, breakables (i.e., glass) shall be removed prior to demolition.

J. TEMPORARY BUILDINGS, TRAILERS (NFPA 241, Ch.2)

- _____ (1) Temporary offices, trailers, sheds, etc. of combustible construction at least 30 feet from permanent buildings.
- _____ (2) Only safety installed approved heating devices used. Ample clearance around stoves, heaters and chimneys per NFPA 211.

K. ROOFING OPERATIONS (NFPA 241, Ch.6)

- _____ (1) Asphalt and tar kettles located outside the building or on a noncombustible roof away from combustibles. Kettles must have gravity lids, tight fitting.
- _____ (2) Torch applied roofing systems shall be installed using extreme caution. Follow manufacturer's instructions. Caution around roof openings, penetrations or flashings.
- _____ (3) Fire extinguisher, 20-B minimum, within 30 feet of roof kettle. At least one extinguisher 2A:20-B:C on the roof being repaired; also one within 30 feet of torch applied roofing equipment.
- _____ (4) Fuel containers at least 10 feet away from burner flame.
- _____ (5) Notify building occupants who might be affected. Coordinate with C.O.T.R.
- _____ (6) Investigate location of supply air intakes. Coordinate shutdowns as necessary with COTR.
- _____ (7) Roof edges will be guarded by means of typical roof protection or a safety monitoring system.

L. EXIT PATHWAYS (NFPA 241, Ch.5; also reference NFPA 101)

- _____ (1) Every building and area will remain accessible to fire department apparatus and personnel. Roadways will be maintained with 20 feet of all buildings.
- _____ (2) Adequate egress paths, including stairs and corridors, will be maintained at all times. Exits may only be blocked temporarily if unavoidable and when adequate alternate measures are provided (signage, temporary fire detection, training, etc.) to warn personnel. Coordinate with COTR.

WORK LOCATION _____

NOTIFIERS SIGNATURE & DATE _____

NAME & PHONE No. _____

CONTRACTOR _____

COTR SIGNATURE & DATE _____

ATTACHMENT #5

NOTIFICATION OF M & R WORK

PROJECT # & TITLE: NRM Project No. 673-09-102, "EP Lab Site Prep"

DATE OF WORK: Sn,M,T,W,Th,F,St _____ START TIME: _____ AM/PM

END TIME: _____ AM/PM ESTIMATED DURATION OF WORK: _____ HOURS

LOCATION OF WORK:

DESCRIPTION OF WORK:

TOOLS & EQUIPMENT TO PERFORM WORK: _____

PERSONNAL PROTECTIVE EQUIPMENT FOR WORK: _____

NAME(S) OF EMPLOYEE(S) PERFORMING WORK:

SUPERVISOR / WORK LEADER SIGNATURE & DATE: _____

SUPERVISOR / WORK LEADER NAME (PRINTED): _____

PROCEDURE(S): _____

All maintenance and repair work must have a written procedure prepared by the maintenance person performing the task.

Before: _____

During: _____

After: _____

DATE AND TIME COTR NOTIFIED:

GENERAL CONTRACTOR'S NOTIFYING PERSON:

NOTIFYING PERSON'S SIGNATURE:

GENERAL CONTRACTOR COMPANY:

PHONE NUMBER(S) :

HPM 138-15: ILSM PROJECT EVALUATION CHECKLIST

Project: _____ Building / Location: _____

Floor: _____ Start Date: _____ Finish Date: _____

Duration: _____

<u>Question</u>	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1. Will existing exits be impaired or blocked?			
2. Will existing corridor width be reduced?			
3. Will alternative exits be required?			
4. Will construction area exit routes be needed?			
5. Will patient access to emergency services be impaired?			
6. Will police, fire, or EMS access to emergency services be impaired?			
7. Will fire alarm system be impaired?			
8. Will sprinkler system be impaired?			
9. Will temporary or equivalent systems be needed?			
10. Will temporary smoke-tight construction partitions be needed?			
11. Will additional handheld fire-fighting equipment be needed?			
12. Will personnel training in the use of handheld fire extinguishers be needed?			
13. Will reinforcement of the smoking policy be needed?			
14. Will a reduction in the flammable or combustible fire load be needed?			
15. Will housekeeping or debris removal practices be needed?			
16. Will additional fire drills or fire response training be needed?			
17. Will increased hazard surveillance of building, grounds, or equipment be needed?			
18. Will special attention to excavations, construction storage, or work areas be needed?			
19. Will training to compensate for structural or compartmentation deficiencies be needed?			
20. Will organization training in LSC deficiencies, construction hazards, or ILSM be needed?			

This evaluation is to be completed by the Safety Office together with the COTR / Project Manager before the start of any construction renovation work to ensure that appropriate ILSM are implemented. If you answered "yes" to any of the questions above, complete all ILSM forms as required and as related to the construction project.

Safety Office: _____ Date: _____

COTR / Project Manager: _____ Date: _____

INTERIM LIFE SAFETY MEASURES (ILSM) ASSIGNMENT

Project: _____ Building / Location: _____

Floor: _____ Start Date: _____ Finish Date: _____

Duration: _____

- _____ 1. Ensuring free and unobstructed exit access and exits. Staff receives additional trailing / communication when alternative exits are designated. Buildings or areas under construction must maintain escape routes for construction workers at all times. Means of exiting construction are inspected daily.
- _____ 2. Ensuring free and unobstructed access to emergency services and for fire, police and other emergency forces.
- _____ 3. Ensuring fire alarm, detection, and suppression systems are in good working order. A temporary, but equivalent system shall be provided when any fire system is impaired. Temporary systems must be inspected and tested monthly. Provide fire watch or evacuate buildings in the event that the fire alarm, detection or suppression systems are taken out of service for more than four hours in a 24-hour period.
- _____ 4. Ensuring temporary construction partitions are smoke tight and built of noncombustible or limited combustible materials that will not contribute to the development or spread of fire in accordance with Section 01 00 00, General Requirements.
- _____ 5. Providing additional fire-fighting equipment and train personnel in its use.
- _____ 6. Prohibiting smoking in or adjacent to construction areas.
- _____ 7. Developing and enforcing storage, housekeeping, and debris removal practices that reduce the buildings flammable and combustible fire load to the lowest feasible level.
- _____ 8. Conducting a minimum of two fire drills per shift per quarter.
- _____ 9. Increasing hazard surveillance of buildings, grounds and equipment, with special attention to excavations, construction areas, construction storage, and field offices.
- _____ 10. Training personnel to compensate for impaired structural or compartmentation features of fire safety.
- _____ 11. Conducting organization wide safety education programs to promote awareness of any LSC deficiencies, construction hazards and these ILSM. Conduct familiarization tours and site visits for local Fire Department, when necessary.

Signature of Safety Office Staff Member

Date

Signature of COTR / Project Manager

Date

INTERIM LIFE SAFETY MEASURES (ILSM) FOR BUILDING LIFE SAFETY CODE DEFICIENCIES

Building: _____ Floor: _____ Room: _____

Description of building life safety code deficiency: _____

PFI ID (If Applicable): _____

Corrective Action to be Taken: _____

- _____ 1. Ensuring free and unobstructed exit access and exits. Staff receives additional training when alternative exits are designated. Buildings or areas under construction must maintain escape routes for construction workers at all times. Means of exiting construction are inspected daily.
- _____ 2. Ensuring free and unobstructed access to emergency services and for fire, police and other emergency forces.
- _____ 3. Ensuring fire alarm, detection, and suppression systems are in good working order. A temporary, but equivalent system shall be provided when any fire system is impaired. Temporary systems must be inspected and tested monthly. Provide fire watch or evacuate buildings in the event that the fire alarm, detection or suppression systems are taken out of service for more than four hours in a 24-hour period.
- _____ 4. Ensuring temporary construction partitions are smoke tight and built of noncombustible or limited combustible materials that will not contribute to the development or spread of fire.
- _____ 5. Providing additional fire-fighting equipment and train personnel in its use.
- _____ 6. Prohibiting smoking in or adjacent to construction areas.
- _____ 7. Developing and enforcing storage, housekeeping, and debris removal practices that reduce the buildings flammable and combustible fire load to the lowest feasible level.
- _____ 8. Conducting a minimum of two fire drills per shift per quarter.
- _____ 9. Increasing hazard surveillance of buildings, grounds and equipment, with special attention to excavations, construction areas, construction storage, and field offices.
- _____ 10. Training personnel to compensate for impaired structural or compartmentation features of fire safety.
- _____ 11. Conducting organization wide safety education programs to promote awareness of any LSC deficiencies, construction hazards and these ILSM. Conduct familiarization tours and site visits for local Fire Department, when necessary.
- _____ 12. Additional measures are not required.

Signature of Safety Office Staff Member

Date

Signature of COTR / Project Manager

Date

DAILY CONSTRUCTION SITE INSPECTION

Date: _____ Inspector: _____

Project Number: _____

<u>Description</u>	<u>Yes</u>	<u>No</u>	<u>Comments</u>
Contractor acknowledge asbestos in writing			
Adequate barriers in place			
Smoke proof			
Dust proof			
Signage in place			
Applicable codes complied with			
Occupational Safety & Health Administration (OSHA) compliance			
*Interim Life Safety in place			
*Staff trained regarding Interim Life Safety			
*Temporary fire protection in place / fire watch			
Contractors aware of egress routes			
*Increase in fire drills, other training			
All exits clear			
Free access to Emergency Services			
Alternate access for public and emergency use			
Additional fire fighting staff & equipment available			
Smoking is strictly prohibited			
Construction site clean and orderly			
*Hazard surveillance occurring? How often?			
*Staff informed if adjacent areas affected			
Construction site restricted			
*Local authorities aware of Interim Life Safety			
Effective site storage of materials, other			
*Fire zones maintained, staff aware of changes			
Contractor confirms egress routes for staff clear			
Hot work permits are being issued.			
Penetrations through firewalls are properly sealed			

*** Safety Office:** Complete applicable items as required.

HPM 138-24: INFECTION CONTROL DURING CONSTRUCTION AND RENOVATION (ICRA)

CLASS II PROJECT = Small scale, short duration activities which create minimal dust.

Date of Project: _____ Project Number: _____

Location of Project / Brief Description:

Name of Employee(s) conducting work:

COTR, Resident or Project Engineer, Supervisor, or designated competent person

PROCEDURES DURING PROJECT:

1. Provide active means to prevent airborne dust from dispersing into the atmosphere (check one).
_____ Containment booth used.
_____ Enclose work area with fire-rated plastic sheeting from floor to ceiling with at least 2-foot overlapping flaps for access to entry.
_____ Use HEPA vacuum at point of dust generation.
2. Water mist work surfaces to control dust while cutting.
3. Seal unused doors with duct tape.
4. Block off and seal HVAC returns.
5. Place dust mat at entrance and exit of work area. Clean or change routinely, as needed.
6. Remove or isolate HVAC system in areas where work is being performed.
7. Complete the daily infection control inspection log for projects lasting more than one day and report any deviations to Infection Control.

PROCEDURES UPON PROJECT COMPLETION:

1. Wipe work surfaces with disinfectant.
2. Contain construction waste before transport in tightly covered containers.

3. Wet mop and / or vacuum with HEPA filtered vacuum before leaving work area.
4. Remove isolation of HVAC systems in areas where work is being performed.

Safety Staff Member (date)

Infection Control (date)

COTR / Construction Supervisor (date)

CLASS III PROJECT = Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies.

Date of Project: _____ Project Number: _____

Location of Project / Brief Description:

Name of Employee(s) conducting work:

COTR, Resident or Project Engineer, Supervisor, or designated competent person

PROCEDURES DURING PROJECT:

1. Remove or isolate HVAC system in area where work is being done to prevent contamination of duct system.
2. Complete all critical barriers (i.e. sheetrock, plywood, plastic), to seal the area from the non - work area or implement the control cube method (cart with plastic covering and sealed connection to the work site with HEPA vacuum for vacuuming prior to exit) before construction begins.
3. Maintain negative air pressure within the work site utilizing HEPA equipped air filtration units.
4. Contain construction waste before transport in tightly covered containers.

5. Cover transport receptacles or carts. Tape the covering unless a solid lid is used.
6. Place dust mat at the entrance / exit of the work area. Clean or change routinely, as needed.
7. Complete the daily infection control inspection log for projects lasting more than one day and report any deviations to Infection Control.

PROCEDURES UPON PROJECT COMPLETION:

1. Do not remove barriers from work area until completed project is inspected by Safety and Infection Control Sections and thoroughly cleaned by Environmental Management Service.
2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
3. Vacuum the work area with HEPA filtered vacuums.
4. Wet mop area with disinfectant.
5. Remove isolation of HVAC system in areas where the work is being performed.

Safety Staff Member (date)

Infection Control (date)

COTR / Construction Supervisor (date)

CLASS IV PROJECT = Major demolition and / or construction projects.

Date of Project: _____ Project Number: _____

Location of Project / Brief Description:

Name of Employee(s) conducting work:

COTR, Resident or Project Engineer, Supervisor, or designated competent person

PROCEDURES DURING PROJECT:

1. Isolate HVAC system in area where work is being done to prevent contamination of the duct system.
2. Complete all critical barriers (i.e. sheetrock, plywood, plastic), to seal the area from the non - work area or implement the control cube method (cart with plastic covering and sealed connection to the work site with HEPA vacuum for vacuuming prior to exit) before construction begins.
3. Maintain negative air pressure within the work site utilizing HEPA equipped air filtration units.
4. Contain construction waste before transport in tightly covered containers.
5. Seal holes, pipes, conduits, and punctures appropriately.
6. Construct an anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving the work site or they can wear cloth or paper coveralls that are removed each time they leave the work site.
7. Complete the daily infection control inspection log for projects lasting more than one day and report any deviations to Infection Control.

PROCEDURES UPON PROJECT COMPLETION:

1. Do not remove barriers from work area until completed project is inspected by the owner's Safety and Infection Control Sections and thoroughly cleaned by the owner's Environmental Management Service.
2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
3. Contain construction waste before transport in tightly covered containers.
4. Cover transport receptacles or carts. Tape covering unless solid lid.
5. Vacuum the work area with HEPA filtered vacuums.
6. Wet mop area with disinfectant.
7. Remove isolation of HVAC system in areas where the work is being performed.

Safety Staff Member (date)

Infection Control (date)

COTR / Construction Supervisor (date)

EXTERNAL DEMOLITION AND DIRT EXCAVATION INFECTION CONTROL NOTIFICATION

Date of Project: _____ Project Number: _____

Location of Project / Brief Description:

Name of Employee(s) conducting work:

COTR, Resident or Project Engineer, Supervisor, or designated competent person

Check Items to be Addressed During the Project in the Table Below:

<u>Item</u>	<u>(√)</u>	<u>Recommendation</u>
Demolition site		Shroud the site if possible to reduce environmental contamination.
Adjacent air intakes		Seal off affected intakes if possible or relocate intake if funds permit.
HVAC system		Consult with the facility engineer about pressure differentials and air recirculation options. Keep facility's indoor air pressure positive relative to the outside.
Filters		Ensure that filters are properly installed. Change pre-filters frequently to prevent dust build-up on high efficiency filters.
Windows		Sealed and caulked to prevent entry of airborne fungal spores.
Doors		Keep closed as much as possible. Do not prop doors open. Seal and caulk unused doors (not emergency exits). Use tacky mats at entrances.
Water pipes		Note water pipe location relative to construction area to prevent intrusion of dust into water systems.
Rooftops		Avoid rooftops during active demolition/construction.
Dust generation		Mist the area with water to minimize dust.
Immune compromised patients		Check likelihood of immune compromised patients being close to construction area. Reroute patient/pedestrian traffic so as to avoid outside areas close to these sites. Use walk-ways protected from demolition / construction sites.
Truck traffic		Reroute if possible or arrange for frequent street cleaning
Education/awareness		Encourage reporting of incidents associated with construction.

Safety Staff Member (date)

Infection Control (date)

COTR / Construction Supervisor (date)

DAILY INFECTION CONTROL INSPECTION LOG

Project Number _____ Project Class _____ Date _____

Follow all provisions listed that apply to the Project Class in the list below:

<u>Class I, II, III, IV</u>		<u>Comments</u>
1. Methods in place to minimize dust generation.		
2. Appropriate signage on doors to construction area.		
3. Appropriate debris transport - covered cart, dedicated elevator, dedicated route.		
4. Area cleaned at end of day. Trash to designated area.		
5. No visible signs of mice, insects, birds or other vermin.		
6. Roof protection in place for projects on roof.		
7. Displaced ceiling tiles are readily replaced.		
8. Traffic pattern discourages patient exposure.		
9. Water disruptions, if needed, are scheduled during low activity		
<u>Class II</u>		
10. Fire-rated plastic barrier encloses work area with 2-ft overlapping flaps for access.		
11. Surfaces water-misted to control dust while cutting and/or HEPA vacuum power tool used.		
12. Unused doors sealed with duct tape.		
<u>Class II, III, IV</u>		
13. Air vents blocked off and sealed.		
14. Dust mat at work area entrance and exit. Cleaned or changed routinely.		
15. Floors not showing visible tracked dirt outside construction area.		
16. HVAC system for this area is sealed or isolated		
<u>Class III, IV</u>		
17. Barrier is solid. Critical barriers to seal area in place before beginning work.		
18. Negative air pressure maintained with HEPA equipped units.		
19. Waste contained in tightly covered containers.		
20. Transport carts sealed with tape if not a solid lid.		
<u>Class IV</u>		
21. Patients relocated away from construction area.		
22. HVAC system for this area is isolated.		
23. Holes, pipes, conduits and punctures are sealed appropriately.		
24. Anteroom present and all personnel are required to pass through and be vacuumed with HEPA vacuum prior to leaving site or they wear coveralls that are removed each time they leave site.		
25. Barriers in place until final inspection by Safety Office and Infection Control and cleaning by Housekeeping		

Inspector Signature

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 32 16
PROJECT SCHEDULES

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 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 will be utilized to satisfy both time and cost applications. All schedule data and reports required under this specification section shall be based upon regular total float, not relative total float schedules.

1.2 CONTRACTOR'S REPRESENTATIVE:

- A. The Contractor shall designate an authorized representative in the firm who will be responsible for the preparation of the Project Schedule, review and report progress of the project with and to the Contracting Officer's representative.
- 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 and such authority shall not be interrupted throughout the duration of the project.
- 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.

1.3 COMPUTER PRODUCED SCHEDULES

- A. The contractor shall provide to the VA monthly computer processing of all computer-produced time/cost schedules and reports generated from monthly project updates. This monthly computer service will include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of Microsoft Project Planner 2003 compatible to the contracting officer's representative; a hard copy

listing of all project schedule changes, and associated data, made at the update and an electronic file of this data in Microsoft Project Planner 2003 compatible format; and the resulting monthly updated schedule in an electronic file in Microsoft Project Planner 2003 compatible format. These must be submitted with and substantively support the contractor's monthly payment request and the signed lookahead report. The COTR shall identify the five different report formats that the contractor shall provide based upon the monthly schedule updates.

- B. The contractor is responsible for the correctness and timeliness of the computer-produced reports. The Contractor is also responsible for the accurate and timely submittal of the updated project schedule and all CPM data necessary to produce the computer reports and payment request that is specified.
- C. The VA shall report errors in computer-produced reports to the Contractor's representative within ten calendar days from receipt of reports. The Contractor will reprocess the computer-produced reports, when requested by the Contracting Officer's representative to correct errors which affect the payment and schedule for the project.

1.4 THE COMPLETE PROJECT SCHEDULE SUBMITTAL

- A. Within 30 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review; three copies of the complete Project Schedule on sheets of paper 279 x 432 mm (11 x 17 inches) and an electronic file in a Microsoft Project Planner 2003 compatible format. The submittal shall also include three copies of a computer-produced activity/event ID schedule showing project duration; phase completion dates; and other data, including event cost. Each activity/event on the computer-produced schedule shall contain as a minimum, but not limited to, activity/event ID, duration, predecessor and successor relationships, trade code, area code, description, 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 and start-to-start, only, without lead or lag constraints. Activity/event date constraints, not required by the

contract, will not be accepted unless submitted to and approved by the Contracting Officer. The contractor shall make a separate written detailed request to the Contracting Officer identifying these date constraints and secure the Contracting Officer's written approval before incorporating them into the Project Schedule. The Contracting Officer's separate approval of the project schedule shall not excuse the contractor of this requirement. Logic events (non-work) will be permitted where necessary to reflect proper logic among work events, but must have a zero duration. The complete working network diagram shall reflect the Contractor's approach to scheduling the complete project. The final network diagram 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 Contractors as bid schedule. These changes/delays shall be entered at the first update after the final network diagram 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.

- B. Within 15 calendar days after receipt of the complete Project Schedule, the Contracting Officer or his representative will do one or both of the following:
1. Notify the Contractor concerning his actions, opinions, and objections.
 2. A meeting with the Contractor at or near the job site for joint review, correction or adjustment of the proposed plan will be scheduled if required. Within 7 calendar days after the joint review, the Contractor shall revise and shall submit three copies of the revised project schedule, three copies of the revised computer-produced activity/event ID schedule and a revised electronic file as specified by the Contracting Officer. The revised submission will be reviewed by the Contracting Officer and, if found to be as previously agreed upon, will be approved.

1.5 WORK ACTIVITY/EVENT COST DATA

- A. The Contractor shall cost load all work activities/events except procurement activities. The cumulative amount of all cost loaded work activities/events (including alternates) shall equal the total contract price. Prorate overhead, profit and general conditions on all work activities/events for the entire project length. The contractor shall generate from this information cash flow curves indicating graphically the total percentage of work activity/event dollar value scheduled to be in place on early finish, late finish. These cash flow curves will be used by the Contracting Officer to assist him in determining approval or disapproval of the cost loading. Negative work activity/event cost data will not be acceptable, except on VA issued contract changes.
- B. The Contractor shall cost load work activities/events for test, balance and adjust various systems in accordance with the provisions in the General Conditions.
- C. In accordance with GENERAL CONDITIONS, 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 ASBESTOS ABATEMENT. The sum of asbestos abatement work activity/event costs shall equal the value of the asbestos bid item in the Contractors' bid.
- E. The Contractor shall cost load work activities/events for all BID ITEMS. The sum of the cost loading for each bid item work activities/events shall equal the value of the item in the Contractors' bid.
- F. Work activities/events for Contractor bond shall have a trade code and area code of BOND.

1.6 PROJECT SCHEDULE REQUIREMENTS

- A. Show on the project schedule the sequence and interdependence of work activities/events required for complete performance of all items of work. In preparing the network diagram, the Contractor shall:
 - 1. Show the following on each work activity/event:

- a. Activity/Event ID number.
 - b. Concise description of the work represented by the activity/event.
(35 characters or less including spaces preferred).
 - c. Performance responsibility or trade code (five alpha characters or less): GEN, MECH, ELEC, CARP, PLAST, or other acceptable abbreviations.
 - d. Duration (in work days.)
 - e. Cost
 - f. Work location (five characters or less), descriptive of the area involved.
 - g. Manpower required (average number of men per day).
2. Show activities/events as:
- a. Contractor's time required for submittal of shop drawings, templates, fabrication, delivery and similar pre-construction work.
 - b. Contracting Officer's and Architect-Engineer's review and approval of shop drawings, equipment schedules, samples, template, or similar items.
 - c. Interruption of VA Medical Center utilities, delivery of Government furnished equipment, and rough-in drawings, project phasing and any other specification requirements.
 - d. Test, balance and adjust various systems and pieces of equipment, maintenance and operation manuals, instructions and preventive maintenance tasks.
 - e. VA inspection and acceptance activity/event with a minimum duration of five work days at the end of each phase and immediately preceding any VA move activity/event required by the contract phasing for that phase. Schedule these activities/events so that only one phase is scheduled for completion within the same 30 consecutive calendar day period (except for those phases immediately preceding the final acceptance). Maintain this scheduling condition throughout the length of the contract unless waived by the Contracting Officer's representative in writing.

- f. Work activities/events for the asbestos abatement bid item shall have a trade code of ASB.
- g. Bid items other than the Base Bid (ITEM 1) and Asbestos Abatement item shall have trade codes corresponding to the appropriate bid item number (e.g., ITM 3, ITM 4 and other items).
- 3. Show not only the activities/events for actual construction work for each trade category of the project, but also trade relationships to indicate the movement of trades from one area, floor, or building, to another area, floor, or building, for at least five trades who are performing major work under this contract.
- 4. Break up the work into activities/events of a duration no longer than 20 work days each, 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 Contracting Officer may approve the showing of a longer duration. The duration for VA approval of any required submittal, shop drawing, or other submittals shall not be less than 20 work days. The construction time as determined by the CPM schedule from early start to late finish for any sub-phase, phase or the entire project shall not exceed the contract time(s) specified or shown.
- 5. 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.
- 6. Uniquely number each activity/event with numbers ranging from 1 to 99998 only.
- B. Submit the following supporting data in addition to the activity/event ID schedule and electronic file (s). Failure of the Contractor to include this data will delay the review of the submittal until the Contracting Officer is in receipt of the missing data:
 - 1. The proposed number of working days per week.
 - 2. The holidays to be observed during the life of the contract (by day, month, and year).
 - 3. The planned number of shifts per day.
 - 4. The number of hours per shift.

5. List the major construction equipment to be used on the site, describing how each piece relates to and will be used in support of the submitted work activities/events.
 6. Provide a typed, doubled spaced, description, at least one page in length, of the plan and your approach to constructing the project.
- 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 Contracting Officer. 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 Contracting Officer's approval of the Project Schedule.
- D. 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 Microsoft Project Planner 2003 compatible, (PDM) produced schedule, reflecting all the activities/events of the complete project network diagram being submitted.

1.7 PAYMENT TO THE CONTRACTOR:

- A. Monthly, the contractor shall submit the certificate for payment reflecting updated schedule activities and cost. The Contractor is entitled to a monthly progress payment upon approval of estimates as determined from the currently approved updated computer-produced calendar-dated schedule unless, in special situations, the Contracting Officer permits an exception to this requirement. Monthly payment requests shall include: three copies of up to five different reports (inclusive of all pages) available within the user defined reports of Microsoft Project Planner 2003 compatible, to the contracting officer's representative; a listing of all project schedule changes, and associated data, made at the update; and an electronic file (s) of the resulting monthly updated schedule in a compressed Microsoft Project Planner 2003 compatible, format. These must be submitted with and substantively support the contractor's monthly application and certificate for payment request documents.
- B. When the Contractor fails or refuses to furnish to the Contracting Officer the information and the associated updated Microsoft Project

Planner 2003 compatible, schedule in electronic format, which, in the sole judgment of the Contracting Officer, is necessary for processing the monthly progress payment, the Contractor shall not be deemed to have provided an estimate and supporting schedule data upon which progress payment may be made.

1.8 PAYMENT AND PROGRESS REPORTING

- A. Monthly job site progress meetings may be held on dates mutually agreed to by the Contracting Officer (or Contracting Officer's representative) and the Contractor. Contractor and the CPM consultant should be required to attend all monthly progress meetings. Presence of Subcontractors during progress meeting is optional unless required by the Contracting Officer (or Contracting Officer's representative). The Contractor shall update the project schedule and all other data required by this section shall be accurately filled in and completed prior to the monthly progress meeting. The Contractor shall provide this information to the Contracting Officer or the VA representative in completed form three work days in advance of the progress meeting. Job progress will be reviewed to verify:
1. Actual start and/or finish dates for updated/completed activities/events.
 2. Remaining duration, required to complete 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 network diagram and computer-produced schedules.
 4. Percentage for completed and partially completed activities/events.
 5. Logic and duration revisions required by this section of the specifications.
 6. Activity/event duration and percent complete shall be updated independently.
- B. The Contractor shall submit a narrative report as a part of his monthly review and update, in a form agreed upon by the Contractor and the Contracting Officer. The narrative report shall include a description of problem areas; current and anticipated delaying factors and their estimated impact on performance of other activities/events and

completion dates; and an explanation of corrective action taken or proposed. This report is in addition to the daily reports required elsewhere.

- C. After completion of the joint review and the Contracting Officer's approval of all entries, the contractor will generate an updated computer-produced calendar-dated schedule and supply the Contracting Officer's representative with reports.
- D. After completing the monthly schedule update, the contractor's scheduling specialist 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 specialist shall use the schedule logic and/or durations provided and approved by the COTR. 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 fourteen (14) calendar days of completing the regular schedule update. **Before inserting the contract changes durations, care must be taken to ensure that only the original durations will be used for the analysis, not the reported durations after progress. In addition, once the final project schedule is approved, the contractor must recreate all manual progress payment updates on this approved project schedule 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.**
- E. After VA acceptance and approval of the Project Schedule, and after each monthly update, the contractor shall submit to the Contracting Officer three copies of a revised Project Schedule showing all completed and partially completed activities/events, contract changes and logic changes made on the intervening updates or at the first update.

F. Following approval of the CPM schedule, the VA, the General Contractor, its approved CPM Specialist, COTR, and all subcontractors needed, as determined by the Contracting Officer, 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.

1.9 RESPONSIBILITY FOR COMPLETION

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

1.10 CHANGES TO THE SCHEDULE

- A. Within 30 calendar days after VA acceptance and approval of any updated computer-produced schedule, the Contractor will submit a revised network diagram, the associated diskette(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, indicate an extension of the project completion by 20 working days or 10 percent of the remaining project duration, whichever is less. Such delays 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 of the network diagram 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 Medical Center, contract phase(s) and sub phase(s), utilities furnished by the Government to the Contractor, or any other previously contracted item, must be furnished in writing to the Contracting Officer for approval.
- C. Contracting Officer's approval for the revised network diagram and all relevant data is contingent upon compliance with all other paragraphs of this section and any other previous agreements by the Contracting Officer or the VA representative.
- D. The cost of revisions to the project schedule resulting from contract changes will be included in the proposal for changes, 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.

1.11 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 Contracting Officer may deem necessary for determination as to whether or not the Contractor is entitled to an extension of time under the provisions of the contract. Submission of proof based on revised activity/event logic, durations (in work days) and costs is obligatory to any approvals. The schedule must clearly display that the Contractor has used, in full, all the float time available for the work involved in this request. The Contracting Officer's determination as to the total number of days of contract extension will be based upon the current computer-produced calendar-dated schedule for the time period in question and all other relevant information.
- B. Actual delays in activities/events which, according to the computer-produced calendar-dated schedule, do not affect the extended and predicted contract completion dates shown by the critical path, will not be the basis for a change to the contract completion date. The Contracting Officer will within a reasonable time after receipt of such justification and supporting evidence, review the facts and advise the Contractor in writing of the Contracting Officer's decision.
- C. The Contractor shall include, as a part of each change order proposal, a sketch showing all CPM logic revisions, duration (in work days) changes, and cost changes, for work in question and its relationship to other activities on the approved network diagram.
- D. All delays due to non-work activities/events such as RFI's, WEATHER, STRIKES, and similar non-work activities/events shall be analyzed on a month by month basis.

- - - E N D - - -

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

PART 1 - GENERAL

- 1.1 For the purposes of this contract, samples, test reports, certificates, and manufacturers' literature and data shall also be subject to the previously referenced requirements. The following text refers to all items collectively as SUBMITTALS.
- 1.2 Submit for approval, all of the items specifically mentioned under the separate sections of the specification, with information sufficient to evidence full compliance with contract requirements. Materials, fabricated articles and the like to be installed in permanent work shall equal those of approved submittals. After an item has been approved, no change in brand or make will be permitted unless:
 - A. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
 - B. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;
 - C. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.
- 1.3 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 will not serve as a basis for extending contract time for completion.
- 1.4 Submittals will be reviewed for compliance with contract requirements by Architect-Engineer, and/or by Resident Engineer on behalf of the Contracting Officer.
- 1.5 Upon receipt of submittals, Architect-Engineer will assign a file number thereto. Contractor, in any subsequent correspondence, shall refer to this file and identification number to expedite replies relative to previously approved or disapproved submittals.
- 1.6 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 therefore by Contracting Officer, adjustment in contract price and time will be made.

- 1.7 Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and Architect-Engineer. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and Architect-Engineer assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.
- 1.8 Submittals must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.
- A. Submit samples required in quadruplicate. 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. 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.

- D. Approved samples will be kept on file by the Resident Engineer 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.
- E. Submittal drawings (shop, erection or setting drawings) and schedules, required for work of various trades, shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with contract requirements. These drawings and schedules shall be stamped and signed by Contractor certifying to such check.
1. For each drawing required, submit one legible photographic paper or vellum reproducible.
 2. Reproducible shall be full size.
 3. Each drawing shall have marked thereon, proper descriptive title, including Medical Center, location, project number, manufacturer's number, reference to contract drawing number, detail Section Number, and Specification Section Number.
 4. A space 120 mm by 125 mm (4-3/4 by 5 inches) shall be reserved on each drawing to accommodate approval or disapproval stamp.
 5. Submit drawings, ROLLED WITHIN A MAILING TUBE, fully protected for shipment.
 6. One reproducible print of approved or disapproved shop drawings will be forwarded to Contractor.
 7. When work is directly related and involves more than one trade, shop drawings shall be submitted to Architect-Engineer under one cover.
- 1.9** At the time of transmittal to the Architect-Engineer, the Contractor shall also send a copy of the complete submittal directly to the Resident Engineer.
- 1.10** Samples for approval shall be sent to Architect-Engineer, in care of Resident Engineer, VA Medical Center,

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

(P.O. Address)

(City, State and Zip Code)

- - - E N D - - -

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)
811 Vermont Avenue, NW - Room 462
Washington, DC 20420
Telephone Number: (202) 565-5214
Between 9:00 AM - 3:00 PM

Or can be found on line at http://wbdg.org/ccb/browse_lib.php?l=02

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.cpmc.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.etl.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

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

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>

- - - E N D - - -

SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies materials testing activities and inspection services required during project construction to be provided by a Testing Laboratory retained and paid for by Contractor.

1.2 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.
- B. American Association of State Highway and Transportation Officials (AASHTO):
- T27-06.....Sieve Analysis of Fine and Coarse Aggregates
- T96-02 (R2006).....Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- T99-01 (R2004).....The Moisture-Density Relations of Soils Using a 2.5 Kg (5.5 lb.) Rammer and a 305 mm (12 in.) Drop
- T104-99 (R2003).....Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- T180-01 (R2004).....Moisture-Density Relations of Soils using a 4.54 kg (10 lb.) Rammer and a 457 mm (18 in.) Drop
- T191-02(R2006).....Density of Soil In-Place by the Sand-Cone Method
- C. American Concrete Institute (ACI):
- 506.4R-94 (R2004).....Guide for the Evaluation of Shotcrete
- D. American Society for Testing and Materials (ASTM):
- A325-07a.....Structural Bolts, Steel, Heat Treated, 120 ksi Minimum Tensile Strength
- A370-08a.....Definitions for Mechanical Testing of Steel Products
- A416/A416M-06.....Steel Strand, Uncoated Seven-Wire for Prestressed Concrete

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

A490-08a.....Heat Treated Steel Structural Bolts, 150 ksi
Minimum Tensile Strength

C31/C31M-08a.....Making and Curing Concrete Test Specimens in the
Field

C33-07.....Concrete Aggregates

C39/C39M-05e2.....Compressive Strength of Cylindrical Concrete
Specimens

C109/C109M-07e1.....Compressive Strength of Hydraulic Cement Mortars

C138-08.....Unit Weight, Yield, and Air Content
(Gravimetric) of Concrete

C140-08.....Sampling and Testing Concrete Masonry Units and
Related Units

C143/C143M-08.....Slump of Hydraulic Cement Concrete

C172-08.....Sampling Freshly Mixed Concrete

C173-08.....Air Content of freshly Mixed Concrete by the
Volumetric Method

C330-05.....Lightweight Aggregates for Structural Concrete

C567-05a.....Density Structural Lightweight Concrete

C780-08.....Pre-construction and Construction Evaluation of
Mortars for Plain and Reinforced Unit Masonry

C1019-08.....Sampling and Testing Grout

C1064/C1064M-08.....Freshly Mixed Portland Cement Concrete

C1077-07a.....Laboratories Testing Concrete and Concrete
Aggregates for Use in Construction and Criteria
for Laboratory Evaluation

C1314-07.....Compressive Strength of Masonry Prisms

D698-07e1.....Laboratory Compaction Characteristics of Soil
Using Standard Effort

D1143-07.....Piles Under Static Axial Compressive Load

D1188-07.....Bulk Specific Gravity and Density of Compacted
Bituminous Mixtures Using Paraffin-Coated
Specimens

D1556-07.....Density and Unit Weight of Soil in Place by the
Sand-Cone Method

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

D1557-07.....Laboratory Compaction Characteristics of Soil
Using Modified Effort

D2166-06.....Unconfined Compressive Strength of Cohesive Soil

D2167-08.....Density and Unit Weight of Soil in Place by the
Rubber Balloon Method

D2216-05.....Laboratory Determination of Water (Moisture)
Content of Soil and Rock by Mass

D6938-08a.....Density of soil and Soil-Aggregate in Place by
Nuclear Methods (Shallow Depth)

D2974-07a.....Moisture, Ash, and Organic Matter of Peat and
Other Organic Soils

D3666-07ae1.....Minimum Requirements for Agencies Testing and
Inspection Bituminous Paving Materials

D3740-08.....Minimum Requirements for Agencies Engaged in the
Testing and Inspecting Road and Paving Material

E94-04.....Radiographic Testing

E164-08.....Ultrasonic Contact Examination of Weldments

E329-08.....Agencies Engaged in Construction Inspection
and/or Testing

E543-08a.....Agencies Performing Non-Destructive Testing

E605-93(2006).....Thickness and Density of Sprayed Fire-Resistive
Material (SFRM) Applied to Structural Members

E709(2008).....Guide for Magnetic Particle Examination

E1155-96(R2008).....Determining FF Floor Flatness and FL Floor
Levelness Numbers

E. American Welding Society (AWS):

D1.1-08.....Structural Welding Code-Steel

1.3 REQUIREMENTS:

- A. Accreditation Requirements: Testing Laboratory retained and paid for by Contractor, must be accredited by one or more of the National Voluntary Laboratory Accreditation Program (NVLAP) programs acceptable in the geographic region for the project. Furnish to the Contracting Officer a copy of the Certificate of Accreditation and Scope of Accreditation. For testing laboratories that have not yet obtained accreditation by a NVLAP program, submit an acknowledgement letter from one of the laboratory

accreditation authorities indicating that the application for accreditation has been received and the accreditation process has started, and submit to the Contracting Officer for approval, certified statements, signed by an official of the testing laboratory attesting that the proposed laboratory, meets or conforms to the ASTM standards listed below as appropriate to the testing field.

1. Laboratories engaged in testing of construction materials shall meet the requirements of ASTM E329.
 2. Laboratories engaged in testing of concrete and concrete aggregates shall meet the requirements of ASTM C1077.
 3. Laboratories engaged in testing of bituminous paving materials shall meet the requirements of ASTM D3666.
 4. Laboratories engaged in testing of soil and rock, as used in engineering design and construction, shall meet the requirements of ASTM D3740.
 5. Laboratories engaged in inspection and testing of steel, stainless steel, and related alloys will be evaluated according to ASTM A880.
 6. Laboratories engaged in non-destructive testing (NDT) shall meet the requirements of ASTM E543.
 7. Laboratories engaged in Hazardous Materials Testing shall meet the requirements of OSHA and EPA.
- B. Inspection and Testing: Testing laboratory shall inspect materials and workmanship and perform tests described herein and additional tests requested by Resident Engineer. When it appears materials furnished, or work performed by Contractor fail to meet construction contract requirements, Testing Laboratory shall direct attention of Resident Engineer to such failure.
- C. Written Reports: Testing laboratory shall submit test reports to Resident Engineer, Contractor, and Local Building Authority within 24 hours after each test is completed unless other arrangements are agreed to in writing by the Resident Engineer. Submit reports of tests that fail to meet construction contract requirements on colored paper.
- D. Verbal Reports: Give verbal notification to Resident Engineer immediately of any irregularity.

E. Test Standards: The Contractor shall include a lump sum allowance of \$5000 for furnishing published standards (ASTM, AASHTO, ACI, ANSI, AWS, ASHRAE, UL, etc.) referred to or specifically referenced which are pertinent to any Sections of these specifications. Furnish one set of standards in single copies or bound volumes to the Resident Engineer within 60 days. Photocopies are not acceptable. Billings for the standards furnished shall be at the net cost to Testing Laboratory. A preliminary list of test standards, with the estimated costs, shall be submitted to the Resident Engineer for review before any publications of reference standards are ordered.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EARTHWORK:

- A. General: The Testing Laboratory shall provide qualified personnel, materials, equipment, and transportation as required to perform the services identified/required herein, within the agreed to schedule and/or time frame. The work to be performed shall be as identified herein and shall include but not be limited to the following:
1. Observe fill and subgrades during proof-rolling to evaluate suitability of surface material to receive fill or base course. Provide recommendations to the Resident Engineer regarding suitability or unsuitability of areas where proof-rolling was observed. Where unsuitable results are observed, witness excavation of unsuitable material and recommend to Resident Engineer extent of removal and replacement of unsuitable materials and observe proof-rolling of replaced areas until satisfactory results are obtained.
 2. Provide part time observation of fill placement and compaction and field density testing in building areas and provide part time observation of fill placement and compaction and field density testing in pavement areas to verify that earthwork compaction obtained is in accordance with contract documents.
 3. Provide supervised geotechnical technician to inspect excavation, subsurface preparation, and backfill for structural fill.
- B. Testing Compaction:

1. Determine maximum density and optimum moisture content for each type of fill, backfill and subgrade material used, in compliance with ASTM D698 and/or ASTM D1557.
2. Make field density tests in accordance with the primary testing method following ASTM D6938 wherever possible. Field density tests utilizing ASTM D1556 shall be utilized on a case by case basis only if there are problems with the validity of the results from the primary method due to specific site field conditions. Should the testing laboratory propose these alternative methods, they should provide satisfactory explanation to the Resident Engineer before the tests are conducted.
 - a. Building Slab Subgrade: At least one test of subgrade for every 185 m² (2000 square feet) of building slab, but in no case fewer than three tests. In each compacted fill layer, perform one test for every 185 m² (2000 square feet) of overlaying building slab, but in no case fewer than three tests.
 - b. Foundation Wall Backfill: One test per 30 m (100 feet) of each layer of compacted fill but in no case fewer than two tests.
 - c. Pavement Subgrade: One test for each 335 m² (400 square yards), but in no case fewer than two tests.
 - d. Curb, Gutter, and Sidewalk: One test for each 90 m (300 feet), but in no case fewer than two tests.
 - e. Trenches: One test at maximum 30 m (100 foot) intervals per 1200 mm (4 foot) of vertical lift and at changes in required density, but in no case fewer than two tests.
 - f. Footing Subgrade: At least one test for each layer of soil on which footings will be placed. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested subgrade when acceptable to Resident Engineer. In each compacted fill layer below wall footings, perform one field density test for every 30 m (100 feet) of wall. Verify subgrade is level, all loose or disturbed soils have been removed, and correlate actual soil conditions observed with those indicated by test borings.

- C. Testing for Footing Bearing Capacity: Evaluate if suitable bearing capacity material is encountered in footing subgrade.
- D. Testing Materials: Test suitability of on-site and off-site borrow as directed by Resident Engineer.

3.2 FOUNDATION PILES:

- A. Witness load test procedure for conformance with ASTM D1143 and interpret test data to verify geotechnical recommendations for pile capacity. Submit load test report in accordance with ASTM D1143.
- B. Review Contractor's equipment, methods, and procedures prior to starting any work on site. Provide continuous inspection of pile installation. Maintain a record of all pertinent phases of operation for submittal to Resident Engineer.
- C. Auger-Placed Piles: Take and test samples of grout in accordance with ASTM C109 for conformance with specified strength requirements. Not less than six cubes shall be made for each day of casting. Test three cubes at 7 days and three at 28 days.
- D. Cast-in-Place Concrete Piles: Test concrete including materials for concrete as required in Article CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
- E. Prestressed Concrete Piles:
 - 1. Inspection at Plant: Inspect forms, placement of reinforcing steel and strands, placement and finishing of concrete, and tensioning of strands.
 - 2. Concrete Testing: Test concrete including materials for concrete as required in Article, CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
 - 3. Test strand for conformance with ASTM A416/A416M and furnish report to Resident Engineer.
 - 4. Inspect piles to insure specification requirements for curing and finishes have been met.

3.3 FOUNDATION CAISSONS:

- A. Concrete Testing: Test concrete including materials for concrete as required in Article, CONCRETE of this section, except make two test cylinders for each day's placement of concrete.
- B. Maintain a record of concrete used in each caisson. Compare records with calculated volumes.
- C. Inspect percussion hole in bottom of each caisson to determine that material is capable of supporting design load.
- D. Inspect sides and bottom of each caisson for compliance with contract documents.
- E. Submit a certified "Caisson Field Record" for each caisson, recording actual elevation at bottom of shaft; final center line location of top; variation of shaft from plumb; results of all tests performed; actual allowable bearing capacity of bottom; depth of socket into rock; levelness of bottom; seepage of water; still water level (if allowed to flood); variation of shaft (from dimensions shown); location and size of reinforcement, and evidence of seams, voids, or channels below the bottom. Verify the actual bearing capacity of the rock strata by the use of a calibrated penetrometer or other acceptable method.
- F. Caissons Bearing on Hardpan: Take undisturbed samples, suitable for tests required, from caisson bottom. Make auger probe to a depth of 2.5 meters (8 feet) below bottom and visually inspect and classify soil. Verify continuity of strata and thickness.
 - 1. Conduct the following test on each sample, and report results and evaluations to the Resident Engineer:
 - a. Unconfined Compression Test (ASTM D2166).
 - b. Moisture Content (ASTM D2216).
 - c. Density.

3.4 LANDSCAPING:

- A. Test topsoil for organic materials, pH, phosphate, potash content, and gradation of particles.
 - 1. Test for organic material by using ASTM D2974.
 - 2. Determine percent of silt, sand, clay, and foreign materials such as rock, roots, and vegetation.
- B. Submit laboratory test report of topsoil to Resident Engineer.

3.5 ASPHALT CONCRETE PAVING:

A. Aggregate Base Course:

1. Determine maximum density and optimum moisture content for aggregate base material in accordance with // AASHTO T180, Method D
2. Make a minimum of three field density tests on each day's final compaction on each aggregate course in accordance with AASHTO T191
3. Sample and test aggregate as necessary to insure compliance with specification requirements for gradation, wear, and soundness as specified in the applicable state highway standards and specifications.

B. Asphalt Concrete:

1. Aggregate: Sample and test aggregates in stock pile and hot-bins as necessary to insure compliance with specification requirements for gradation (AASHTO T27), wear (AASHTO T96), and soundness (AASHTO T104).
2. Temperature: Check temperature of each load of asphalt concrete at mixing plant and at site of paving operation.
3. Density: Make a minimum of two field density tests in accordance with ASTM D1188 of asphalt base and surface course for each day's paving operation.

3.6 SITE WORK CONCRETE:

Test site work concrete including materials for concrete as required in Article CONCRETE of this section.

3.7 POST-TENSIONING OF CONCRETE:

- A. Inspection Prior to Concreting: Inspect tendons, drape of tendons, and anchorage components for compliance prior to concreting.
- B. Concrete Testing: As required in Article, CONCRETE of this section except make three test cylinders representing each area to be tensioned and cylinders shall be cured in same manner as concrete they represent. Make compression test prior to determining minimum specified strength required for post-tensioning.
- C. Post-tensioning: Witness post-tensioning operation and record actual gauge pressures and elongations applied to each tendon.
- D. Submit reports in quadruplicate of the following:
 1. Inspection of placement and post-tensioning of all tendons.

2. Size, number, location, and drape of tendons.
3. Calculated elongations, based upon the length, modulus of elasticity, and cross-sectional area of the tendons used.
4. Actual field elongations. Check elongation of tendons within ranges established by manufacturer.
5. Calculated gauge pressure and jacking force applied to each tendon.
6. Actual gauge pressures and jacking force applied to each tendon.
7. Required concrete strength at time of jacking.
8. Actual concrete strength at time of jacking.
9. Do not cut or cover the tendon ends until the Contractor receives the Resident Engineer's written approval of the post-tensioning records.

3.8 CONCRETE:

A. Batch Plant Inspection and Materials Testing:

1. Perform continuous batch plant inspection until concrete quality is established to satisfaction of Resident Engineer with concurrence of Contracting Officer and perform periodic inspections thereafter as determined by Resident Engineer.
2. Periodically inspect and test batch proportioning equipment for accuracy and report deficiencies to Resident Engineer.
3. Sample and test mix ingredients as necessary to insure compliance with specifications.
4. Sample and test aggregates daily and as necessary for moisture content. Test the dry rodded weight of the coarse aggregate whenever a sieve analysis is made, and when it appears there has been a change in the aggregate.
5. Certify, in duplicate, ingredients and proportions and amounts of ingredients in concrete conform to approved trial mixes. When concrete is batched or mixed off immediate building site, certify (by signing, initialing or stamping thereon) on delivery slips (duplicate) that ingredients in truck-load mixes conform to proportions of aggregate weight, cement factor, and water-cement ratio of approved trial mixes.

B. Field Inspection and Materials Testing:

1. Provide a technician at site of placement at all times to perform concrete sampling and testing.

2. Review the delivery tickets of the ready-mix concrete trucks arriving on-site. Notify the Contractor if the concrete cannot be placed within the specified time limits or if the type of concrete delivered is incorrect. Reject any loads that do not comply with the Specification requirements. Rejected loads are to be removed from the site at the Contractor's expense. Any rejected concrete that is placed will be subject to removal.
3. Take concrete samples at point of placement in accordance with ASTM C172. Mold and cure compression test cylinders in accordance with ASTM C31. Make at least three cylinders for each 40 m³ (50 cubic yards) or less of each concrete type, and at least three cylinders for any one day's pour for each concrete type. Label each cylinder with an identification number. Resident Engineer may require additional cylinders to be molded and cured under job conditions.
4. Perform slump tests in accordance with ASTM C143. Test the first truck each day, and every time test cylinders are made. Test pumped concrete at the hopper and at the discharge end of the hose at the beginning of each day's pumping operations to determine change in slump.
5. Determine the air content of concrete per ASTM C173. For concrete required to be air-entrained, test the first truck and every 20 m³ (25 cubic yards) thereafter each day. For concrete not required to be air-entrained, test every 80 m³ (100 cubic yards) at random. For pumped concrete, initially test concrete at both the hopper and the discharge end of the hose to determine change in air content.
6. If slump or air content fall outside specified limits, make another test immediately from another portion of same batch.
7. Perform unit weight tests in compliance with ASTM C138 for normal weight concrete and ASTM C567 for lightweight concrete. Test the first truck and each time cylinders are made.
8. Notify laboratory technician at batch plant of mix irregularities and request materials and proportioning check.
9. Verify that specified mixing has been accomplished.

10. Environmental Conditions: Determine the temperature per ASTM C1064 for each truckload of concrete during hot weather and cold weather concreting operations:
 - a. When ambient air temperature falls below 4.4 degrees C (40 degrees F), record maximum and minimum air temperatures in each 24 hour period; record air temperature inside protective enclosure; record minimum temperature of surface of hardened concrete.
 - b. When ambient air temperature rises above 29.4 degrees C (85 degrees F), record maximum and minimum air temperature in each 24 hour period; record minimum relative humidity; record maximum wind velocity; record maximum temperature of surface of hardened concrete.
11. Inspect the reinforcing steel placement, including bar size, bar spacing, top and bottom concrete cover, proper tie into the chairs, and grade of steel prior to concrete placement. Submit detailed report of observations.
12. Observe conveying, placement, and consolidation of concrete for conformance to specifications.
13. Observe condition of formed surfaces upon removal of formwork prior to repair of surface defects and observe repair of surface defects.
14. Observe curing procedures for conformance with specifications, record dates of concrete placement, start of preliminary curing, start of final curing, end of curing period.
15. Observe preparations for placement of concrete:
 - a. Inspect handling, conveying, and placing equipment, inspect vibrating and compaction equipment.
 - b. Inspect preparation of construction, expansion, and isolation joints.
16. Observe preparations for protection from hot weather, cold weather, sun, and rain, and preparations for curing.
17. Observe concrete mixing:
 - a. Monitor and record amount of water added at project site.
 - b. Observe minimum and maximum mixing times.
18. Measure concrete flatwork for levelness and flatness as follows:

- a. Perform Floor Tolerance Measurements F_F and F_L in accordance with ASTM E1155. Calculate the actual overall F- numbers using the inferior/superior area method.
 - b. Perform all floor tolerance measurements within 48 hours after slab installation and prior to removal of shoring and formwork.
 - c. Provide the Contractor and the Resident Engineer with the results of all profile tests, including a running tabulation of the overall F_F and F_L values for all slabs installed to date, within 72 hours after each slab installation.
19. Other inspections:
- a. Grouting under base plates.
 - b. Grouting anchor bolts and reinforcing steel in hardened concrete.
- C. Laboratory Tests of Field Samples:
1. Test compression test cylinders for strength in accordance with ASTM C39. For each test series, test one cylinder at 7 days and one cylinder at 28 days. Use remaining cylinder as a spare tested as directed by Resident Engineer. Compile laboratory test reports as follows: Compressive strength test shall be result of one cylinder, except when one cylinder shows evidence of improper sampling, molding or testing, in which case it shall be discarded and strength of spare cylinder shall be used.
 2. Make weight tests of hardened lightweight structural concrete in accordance with ASTM C567.
 3. Furnish certified compression test reports (duplicate) to Resident Engineer. In test report, indicate the following information:
 - a. Cylinder identification number and date cast.
 - b. Specific location at which test samples were taken.
 - c. Type of concrete, slump, and percent air.
 - d. Compressive strength of concrete in MPa (psi).
 - e. Weight of lightweight structural concrete in kg/m^3 (pounds per cubic feet).
 - f. Weather conditions during placing.
 - g. Temperature of concrete in each test cylinder when test cylinder was molded.
 - h. Maximum and minimum ambient temperature during placing.

- i. Ambient temperature when concrete sample in test cylinder was taken.
- j. Date delivered to laboratory and date tested.

3.9 REINFORCEMENT:

- A. Review mill test reports furnished by Contractor.
- B. Make one tensile and one bend test in accordance with ASTM A370 from each pair of samples obtained.
- C. Written report shall include, in addition to test results, heat number, manufacturer, type and grade of steel, and bar size.
- D. Perform tension tests of mechanical and welded splices in accordance with ASTM A370.

3.10 SHOTCRETE:

- A. Inspection and Material Testing:
 - 1. Provide field inspection and testing service as required by Resident Engineer to certify that shotcrete has been applied in accordance with contract documents.
 - 2. Periodically inspect and test proportioning equipment for accuracy and report deficiencies to Resident Engineer.
 - 3. Sample and test mix ingredients as necessary to insure compliance with specifications.
 - 4. Sample and test aggregates daily and as necessary for moisture content. Report instances of excessive moisture to Resident Engineer.
 - 5. Certify, in duplicate, that ingredients and proportions and amounts of ingredients in shotcrete conform to approved trial mixes.
 - 6. Provide field inspection of the proper size and placement of the reinforcement in the shotcrete.
- B. Shotcrete Sampling:
 - 1. Provide a technician at site of placement to perform shotcrete sampling.
 - 2. Take cores in accordance with ACI 506.
 - 3. Insure maintenance of water-cement ratio established by approved trial mix.
 - 4. Verify specified mixing has been accomplished.
- C. Laboratory Tests of Field Sample Panels:

1. Compression test core for strength in accordance with ACI 506. For each test series of three cores, test one core at 7 days and one core at 28 days. Use remaining core as a spare to be tested at either 7 or 28 days as required. Compile laboratory test reports as follows:
Compressive strength test shall be result of one core, except when one core shows evidence of improper sampling or testing, in which case it shall be discarded and strength of spare core shall be used.
2. Submit certified compression test reports (duplicate) to Resident Engineer. On test report, indicate following information:
 - a. Core identification number and date cast.
 - b. Specific location at which test samples were taken.
 - c. Compressive strength of shotcrete in MPa (psi).
 - d. Weather conditions during placing.
 - e. Temperature of shotcrete in each test core when test core was taken.
 - f. Maximum and minimum ambient temperature during placing.
 - g. Ambient temperature when shotcrete sample was taken.
 - h. Date delivered to laboratory and date tested.
- D. Submit inspection reports certification and instances of noncompliance to Resident Engineer.

3.11 PRESTRESSED CONCRETE:

- A. Inspection at Plant: Forms, placement and concrete cover of reinforcing steel and tendons, placement and finishing of concrete, and tensioning of tendons.
- B. Concrete Testing: Test concrete including materials for concrete required in Article, CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
- C. Test tendons for conformance with ASTM A416 and furnish report to Resident Engineer.
- D. Inspect members to insure that specification requirements for curing and finishes have been met.

3.12 ARCHITECTURAL PRECAST CONCRETE:

- A. Inspection at Plant: Forms, placement of reinforcing steel, concrete cover, and placement and finishing of concrete.

- B. Concrete Testing: Test concrete including materials for concrete as required in Article CONCRETE of this section, except make two test cylinders for each day's production of each strength of concrete produced.
- C. Inspect members to insure specification requirements for curing and finishes have been met.

3.13 MASONRY:

- A. Mortar Tests:
 - 1. Laboratory compressive strength test:
 - a. Comply with ASTM C780.
 - b. Obtain samples during or immediately after discharge from batch mixer.
 - c. Furnish molds with 50 mm (2 inch), 3 compartment gang cube.
 - d. Test one sample at 7 days and 2 samples at 28 days.
 - 2. Two tests during first week of operation; one test per week after initial test until masonry completion.
- B. Grout Tests:
 - 1. Laboratory compressive strength test:
 - a. Comply with ASTM C1019.
 - b. Test one sample at 7 days and 2 samples at 28 days.
 - c. Perform test for each 230 m² (2500 square feet) of masonry.
- C. Masonry Unit Tests:
 - 1. Laboratory Compressive Strength Test:
 - a. Comply with ASTM C140.
 - b. Test 3 samples for each 460 m² (5000 square feet) of wall area.
- D. Prism Tests: For each type of wall construction indicated, test masonry prisms per ASTM C1314 for each 460 m² (5000 square feet) of wall area. Prepare one set of prisms for testing at 7 days and one set for testing at 28 days.

3.14 STRUCTURAL STEEL:

- A. General: Provide shop and field inspection and testing services to certify structural steel work is done in accordance with contract documents. Welding shall conform to AWS D1.1 Structural Welding Code.
- B. Prefabrication Inspection:

1. Review design and shop detail drawings for size, length, type and location of all welds to be made.
2. Approve welding procedure qualifications either by pre-qualification or by witnessing qualifications tests.
3. Approve welder qualifications by certification or retesting.
4. Approve procedure for control of distortion and shrinkage stresses.
5. Approve procedures for welding in accordance with applicable sections of AWS D1.1.

C. Fabrication and Erection:

1. Weld Inspection:

- a. Inspect welding equipment for capacity, maintenance and working condition.
- b. Verify specified electrodes and handling and storage of electrodes in accordance with AWS D1.1.
- c. Inspect preparation and assembly of materials to be welded for conformance with AWS D1.1.
- d. Inspect preheating and interpass temperatures for conformance with AWS D1.1.
- e. Measure 25 percent of fillet welds.
- f. Welding Magnetic Particle Testing: Test in accordance with ASTM E709 for a minimum of:
 - 1) 20 percent of all shear plate fillet welds at random, final pass only.
 - 2) 20 percent of all continuity plate and bracing gusset plate fillet welds, at random, final pass only.
 - 3) 100 percent of tension member fillet welds (i.e., hanger connection plates and other similar connections) for root and final passes.
 - 4) 20 percent of length of built-up column member partial penetration and fillet welds at random for root and final passes.
 - 5) 100 percent of length of built-up girder member partial penetration and fillet welds for root and final passes.
- g. Welding Ultrasonic Testing: Test in accordance with ASTM E164 and AWS D1.1 for 100 percent of all full penetration welds, braced and

moment frame column splices, and a minimum of 20 percent of all other partial penetration column splices, at random.

- h. Verify that correction of rejected welds are made in accordance with AWS D1.1.
- i. Testing and inspection do not relieve the Contractor of the responsibility for providing materials and fabrication procedures in compliance with the specified requirements.

2. Bolt Inspection:

- a. Inspect high-strength bolted connections in accordance AISC Specifications for Structural Joints Using ASTM A325 or A490 Bolts.
- b. Slip-Critical Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in each connection in accordance with AISC Specifications for Structural Joints Using ASTM A325 or A490 Bolts. Inspect all bolts in connection when one or more are rejected.
- c. Fully Pre-tensioned Connections: Inspect 10 percent of bolts, but not less than 2 bolts, selected at random in 25 percent of connections in accordance with AISC Specification for Structural Joints Using ASTM A325 or A490 Bolts. Inspect all bolts in connection when one or more are rejected.
- d. Bolts installed by turn-of-nut tightening may be inspected with calibrated wrench when visual inspection was not performed during tightening.
- e. Snug Tight Connections: Inspect 10 percent of connections verifying that plies of connected elements have been brought into snug contact.
- f. Inspect field erected assemblies; verify locations of structural steel for plumbness, level, and alignment.

- D. Submit inspection reports, record of welders and their certification, and identification, and instances of noncompliance to Resident Engineer.

3.15 STEEL DECKING:

- A. Provide field inspection of welds of metal deck to the supporting steel, and testing services to insure steel decking has been installed in accordance with contract documents and manufacturer's requirements.

- B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS D1.1. Refer to the "Plug Weld Qualification Procedure" in Part 3 "Field Quality Control."
- C. Submit inspection reports, certification, and instances of noncompliance to Resident Engineer.

3.16 SHEAR CONNECTOR STUDS:

- A. Provide field inspection and testing services required by AWS D.1 to insure shear connector studs have been installed in accordance with contract documents.
- B. Tests: Test 20 percent of headed studs for fastening strength in accordance with AWS D1.1.
- C. Submit inspection reports, certification, and instances of noncompliance to Resident Engineer.

3.17 SPRAYED-ON FIREPROOFING:

- A. Provide field inspection and testing services to certify sprayed-on fireproofing has been applied in accordance with contract documents.
- B. Obtain a copy of approved submittals from Resident Engineer.
- C. Use approved installation in test areas as criteria for inspection of work.
- D. Test sprayed-on fireproofing for thickness and density in accordance with ASTM E605.
 - 1. Thickness gauge specified in ASTM E605 may be modified for pole extension so that overhead sprayed material can be reached from floor.
- E. Location of test areas for field tests as follows:
 - 1. Thickness: Select one bay per floor, or one bay for each 930 m² (10,000 square feet) of floor area, whichever provides for greater number of tests. Take thickness determinations from each of following locations: Metal deck, beam, and column.
 - 2. Density: Take density determinations from each floor, or one test from each 930 m² (10,000 square feet) of floor area, whichever provides for greater number of tests, from each of the following areas: Underside of metal deck, beam flanges, and beam web.

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

F. Submit inspection reports, certification, and instances of noncompliance to Resident Engineer.

- - - E N D - - -

SECTION 01 57 19
TEMPORARY ENVIRONMENTAL CONTROLS

EP-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.

EP-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.

EP-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

EP-4. SUBMITTALS

- A. In accordance with Section, 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:
 1. Environmental Protection Plan: After the contract is awarded and prior to the commencement of the work, the Contractor shall meet with the Resident Engineer to discuss the proposed Environmental Protection Plan and to develop mutual understanding relative to details of environmental protection. Not more than 20 days after the meeting, the Contractor shall prepare and submit to the Resident Engineer and the Contracting Officer for approval, a written and/or graphic Environmental Protection Plan including, but not limited to, the following:
 - a. Name(s) of person(s) within the Contractor's organization who is (are) responsible for ensuring adherence to the Environmental Protection Plan.
 - b. Name(s) and qualifications of person(s) responsible for manifesting hazardous waste to be removed from the site.

- C. Name(s) and qualifications of person(s) responsible for training the Contractor's environmental protection personnel.
- d. Description of the Contractor's environmental protection personnel training program.
- e. A list of Federal, State, and local laws, regulations, and permits concerning environmental protection, pollution control, noise control and abatement that are applicable to the Contractor's proposed operations and the requirements imposed by those laws, regulations, and permits.
- f. Methods for protection of features to be preserved within authorized work areas including trees, shrubs, vines, grasses, ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, and archeological and cultural resources.
- g. Procedures to provide the environmental protection that comply with the applicable laws and regulations. Describe the procedures to correct pollution of the environment due to accident, natural causes, or failure to follow the procedures as described in the Environmental Protection Plan.
- h. Permits, licenses, and the location of the solid waste disposal area.
- i. Drawings showing locations of any proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials. Include as part of an Erosion Control Plan approved by the District Office of the U.S. Soil Conservation Service and the Department of Veterans Affairs.
- j. Environmental Monitoring Plans for the job site including land, water, air, and noise.
- k. Work Area Plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. Plan should include measures for marking the limits of use areas. This plan may be incorporated within the Erosion Control Plan.

- B. Approval of the Contractor's Environmental Protection Plan will not relieve the Contractor of responsibility for adequate and continued control of pollutants and other environmental protection measures.

EP-5. PROTECTION OF ENVIRONMENTAL RESOURCES

- A. Protect environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire period of this contract. Confine activities to areas defined by the specifications and drawings.
- B. Protection of Land Resources: Prior to construction, identify all land resources to be preserved within the work area. Do not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without permission from the Resident Engineer. Do not fasten or attach ropes, cables, or guys to trees for anchorage unless specifically authorized, or where special emergency use is permitted.
 - 1. Work Area Limits: Prior to any construction, mark the areas that require work to be performed under this contract. Mark or fence isolated areas within the general work area that are to be saved and protected. Protect monuments, works of art, and markers before construction operations begin. Convey to all personnel the purpose of marking and protecting all necessary objects.
 - 2. Protection of Landscape: Protect trees, shrubs, vines, grasses, land forms, and other landscape features shown on the drawings to be preserved by marking, fencing, or using any other approved techniques.
 - a. Box and protect from damage existing trees and shrubs to remain on the construction site.
 - b. Immediately repair all damage to existing trees and shrubs by trimming, cleaning, and painting with antiseptic tree paint.
 - c. Do not store building materials or perform construction activities closer to existing trees or shrubs than the farthest extension of their limbs.
 - 3. Reduction of Exposure of Unprotected Erodible Soils: Plan and conduct earthwork to minimize the duration of exposure of unprotected soils. Clear areas in reasonably sized increments only as needed to use.

Form earthwork to final grade as shown. Immediately protect side slopes and back slopes upon completion of rough grading.

4. Temporary Protection of Disturbed Areas: Construct diversion ditches, benches, and berms to retard and divert runoff from the construction site to protected drainage areas approved under paragraph 208 of the Clean Water Act.
 - a. Sediment Basins: Trap sediment from construction areas in temporary or permanent sediment basins that accommodate the runoff of a local (design year) storm. After each storm, pump the basins dry and remove the accumulated sediment. Control overflow/drainage with paved weirs or by vertical overflow pipes, draining from the surface.
 - b. Reuse or conserve the collected topsoil sediment as directed by the Resident Engineer.
 - c. Institute effluent quality monitoring programs as required by Federal, State, and local environmental agencies.
5. Erosion and Sedimentation Control Devices: The erosion and sediment controls selected and maintained by the Contractor shall be such that water quality standards are not violated as a result of the Contractor's activities. Construct or install all temporary and permanent erosion and sedimentation control features on the Environmental Protection Plan. Maintain temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basins, grassing, and mulching, until permanent drainage and erosion control facilities are completed and operative.
6. Manage borrow areas on Government property to minimize erosion and to prevent sediment from entering nearby water courses or lakes.
7. Manage and control spoil areas on Government property to limit spoil to areas shown on the Environmental Protection Plan and prevent erosion of soil or sediment from entering nearby water courses or lakes.
8. Protect adjacent areas from despoilment by temporary excavations and embankments.
9. Handle and dispose of solid wastes in such a manner that will prevent contamination of the environment. Place solid wastes (excluding

clearing debris) in containers that are emptied on a regular schedule. Transport all solid waste off Government property and dispose of waste in compliance with Federal, State, and local requirements.

10. Store chemical waste away from the work areas in corrosion resistant containers and dispose of waste in accordance with Federal, State, and local regulations.
 11. Handle discarded materials other than those included in the solid waste category as directed by the Resident Engineer.
- C. Protection of Water Resources: Keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters and sewer systems. Implement management techniques to control water pollution by the listed construction activities that are included in this contract.
1. Washing and Curing Water: Do not allow wastewater directly derived from construction activities to enter water areas. Collect and place wastewater in retention ponds allowing the suspended material to settle, the pollutants to separate, or the water to evaporate.
 2. Control movement of materials and equipment at stream crossings during construction to prevent violation of water pollution control standards of the Federal, State, or local government.
 3. Monitor water areas affected by construction.
- D. Protection of Fish and Wildlife Resources: Keep construction activities under surveillance, management, and control to minimize interference with, disturbance of, or damage to fish and wildlife. Prior to beginning construction operations, list species that require specific attention along with measures for their protection.
- E. Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with the State of Florida DEP and Federal emission and performance laws and standards. Maintain ambient air quality standards set by the Environmental Protection Agency, for those construction operations and activities specified.

1. Particulates: Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.
 2. Particulates Control: Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.
 3. Hydrocarbons and Carbon Monoxide: Control monoxide emissions from equipment to Federal and State allowable limits.
 4. Odors: Control odors of construction activities and prevent obnoxious odors from occurring.
- F. Reduction of Noise: Minimize noise using every action possible. Perform noise-producing work in less sensitive hours of the day or week as directed by the Resident Engineer. Maintain noise-produced work at or below the decibel levels and within the time periods specified.
1. Perform construction activities involving repetitive, high-level impact noise only between 8:00 a.m. and 6:00 p.m unless otherwise permitted by local ordinance or the Resident Engineer. Repetitive impact noise on the property shall not exceed the following dB limitations:

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

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

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

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

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

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

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

d. Use efficient silencers on equipment air intakes.

e. Use efficient intake and exhaust mufflers on internal combustion engines that are maintained so equipment performs below noise levels specified.

f. Line hoppers and storage bins with sound deadening material.

g. Conduct truck loading, unloading, and hauling operations so that noise is kept to a minimum.

3. Measure sound level for noise exposure due to the construction at least once every five successive working days while work is being performed above 55 dB(A) noise level. Measure noise exposure at the property line or 15 m (50 feet) from the noise source, whichever is greater. Measure the sound levels on the A weighing network of a General Purpose sound level meter at slow response. To minimize the

effect of reflective sound waves at buildings, take measurements at 900 to 1800 mm (three to six feet) in front of any building face.

Submit the recorded information to the Resident Engineer noting any problems and the alternatives for mitigating actions.

- G. Restoration of Damaged Property: If any direct or indirect damage is done to public or private property resulting from any act, omission, neglect, or misconduct, the Contractor shall restore the damaged property to a condition equal to that existing before the damage at no additional cost to the Government. Repair, rebuild, or restore property as directed or make good such damage in an acceptable manner.
- H. Final Clean-up: On completion of project and after removal of all debris, rubbish, and temporary construction, Contractor shall leave the construction area in a clean condition satisfactory to the Resident Engineer. 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.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

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 50 Kg (110 pound) mat finish white paper.
- B. Cut to 100 mm (4-inch) wide by 300 mm (12 inch) long size tag.
- C. Punch 3 mm (1/8-inch) diameter hole centered on 100 mm (4-inch) dimension of tag. Edge of Hole spaced approximately 13 mm (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 0.3 mm (0.0120-inch) thick, attach to tag with twist tie, leaving 150 mm (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 3 mm (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.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

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 (eg, concrete, masonry and asphalt).
 - 3. Clean dimensional wood and palette wood.
 - 4. Green waste (biodegradable landscaping materials).
 - 5. Engineered wood products (plywood, particle board and I-joists, etc).
 - 6. Metal products (eg, steel, wire, beverage containers, copper, etc).
 - 7. Cardboard, paper and packaging.
 - 8. Bitumen roofing materials.
 - 9. Plastics (eg, ABS, PVC).
 - 10. Carpet and/or pad.
 - 11. Gypsum board.
 - 12. Insulation.
 - 13. Paint.
 - 14. Fluorescent lamps.

1.2 RELATED WORK

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

C. Lead Paint: Section 02 83 33.13, LEAD BASED PAINT REMOVAL AND DISPOSAL.

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 Resident Engineer 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 job site waste to be generated:

- a. List of each material and quantity to be salvaged, reused, 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, 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, invoices. Include the net total costs for each disposal.

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.

1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material test reports.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- D. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- E. Preinstallation Conference: Conduct conference at Project site. Include equipment manufacturer's representative.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.2 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I/II, gray. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F or C.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, graded.
 - 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal, unless noted otherwise.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.

2.3 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.4 VAPOR RETARDERS

- A. Sheet Vapor Retarder: Polyethylene sheet, ASTM D 4397, not less than 10 mils thick.

2.5 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
- G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.6 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

2.7 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total

amount of portland cement, which would otherwise be used, by not less than 40 percent.

C. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

D. Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 5 inches, plus or minus 1 inch, unless otherwise noted. Slump may be 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture.
4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.8 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.2 VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.3 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

3.5 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of reinforcement and embedded items is complete and that required inspections have been performed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

C. Cold-Weather Placement: Comply with ACI 306.1.

D. Hot-Weather Placement: Comply with ACI 301.

3.6 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces to receive trowel finish.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
2. Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4 inch, typical. The floor slab shall be level with the top of the treatment couch bearing mount to within +/- 1/8" for a 6'-0" radius about the isocenter.

3.7 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.8 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.9 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION:

Section specifies wood blocking, framing, sheathing, furring, nailers, as shown on drawings. Coordinate this section with shielding requirements specified in other parts of the construction documents.

1.2 RELATED WORK:

- A. Manufactured Plastic Casework: Section 12 34 00, MANUFACTURED PLASTIC CASEWORK
- B. Plastic Laminate Healthcare Casework: Section 12 35 700, PLASTIC LAMINATE HEALTHCARE CASEWORK
- C. Countertops: Section 12 36 00, COUNTERTOPS
- D. Gypsum sheathing: Section 09 29 00, GYPSUM BOARD.
- E. Section 13 49 00: RADIATION PROTECTION

1.3 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings showing framing connection details, fasteners, connections and dimensions.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Protect lumber and other products from dampness both during and after delivery at site.
- B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.
- C. Stack plywood and other board products so as to prevent warping.
- D. Locate stacks on well drained areas, supported at least 150 mm (6 inches) above grade and cover with well ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

1.5 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 Forest and Paper Association (AFPA):

- National Design Specification for Wood Construction
NDS-05.....Conventional Wood Frame Construction
- C. American Institute of Timber Construction (AITC):
A190.1-2007.....Structural Glued Laminated Timber
- D. American Society of Mechanical Engineers (ASME):
B18.2.1A-96(R2005).....Square and Hex Bolts and Screws
B18.2.2-87(R2005).....Square and Hex Nuts
B18.6.1-81 (R2008).....Wood Screws
B18.6.4-1999(R2005).....Thread Forming and Thread Cutting Tapping Screws
and Metallic Drive Screws
- E. American Plywood Association (APA):
E30U-2007.....Engineered Wood Construction Guide
- F. American Society for Testing And Materials (ASTM):
A47-99(2004).....Ferritic Malleable Iron Castings
A48-03 (2008).....Gray Iron Castings
A653/A653M-08.....Steel Sheet Zinc-Coated (Galvanized) or Zinc-
Iron Alloy Coated (Galvannealed) by the Hot Dip
Process
C954-07.....Steel Drill Screws for the Application of Gypsum
Board or Metal Plaster Bases to Steel Studs from
0.033 inch (2.24 mm) to 0.112-inch (2.84 mm) in
thickness
C1002-07.....Steel Self-Piercing Tapping Screws for the
Application of Gypsum Panel Products or Metal
Plaster Bases to Wood Studs or Metal Studs
D143-94 (2007).....Small Clear Specimens of Timber, Method of
Testing
D1760-01.....Pressure Treatment of Timber Products
D2559-04.....Adhesives for Structural Laminated Wood Products
for Use Under Exterior (Wet Use) Exposure
Conditions
D3498-03.....Adhesives for Field-Gluing Plywood to Lumber
Framing for Floor Systems
F844-07a.....Washers, Steel, Plan (Flat) Unhardened for
General Use

- F1667-05.....Nails, Spikes, and Staples
- G. Federal Specifications (Fed. Spec.):
- MM-L-736C.....Lumber; Hardwood
- H. Commercial Item Description (CID):
- A-A-55615.....Shield, Expansion (Wood Screw and Lag Bolt Self
Threading Anchors)
- I. Military Specification (Mil. Spec.):
- MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated
- J. Truss Plate Institute (TPI):
- TPI-1-2007.....Metal Plate Connected Wood Trusses
- K. U.S. Department of Commerce Product Standard (PS)
- PS 1-07.....Structural Plywood
- PS 20-05.....American Softwood Lumber Standard

PART 2 - PRODUCTS

2.1 LUMBER:

- A. Unless otherwise specified, each piece of lumber bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.
1. Identifying marks in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
 2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.
- B. Structural Members: Species and grade as listed in the AFPA, National Design Specification for Wood Construction having design stresses as shown.
- C. Lumber Other Than Structural:
1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
 2. Framing lumber: Minimum extreme fiber stress in bending of 1100.
 3. Furring, blocking, nailers and similar items 100 mm (4 inches) and narrower Standard Grade; and, members 150 mm (6 inches) and wider, Number 2 Grade.

D. Sizes:

1. Conforming to Prod. Std., PS20.
2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.

E. Moisture Content:

1. At time of delivery and maintained at the site.
2. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
3. Lumber over 50 mm (2 inches) thick: 25 percent or less.

F. Fire Retardant Treatment:

1. All concealed wood shall be fire retardant treated.
2. Mil Spec. MIL-L-19140 with piece of treated material bearing identification of testing agency and showing performance rating.
3. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.

G. Preservative Treatment:

1. Do not treat Heart Redwood and Western Red Cedar.
2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 600 mm (24 inches) from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members used in connection with roofing and flashing materials.
3. Treat other members specified as preservative treated (PT).
4. Preservative treat by the pressure method complying with ASTM D1760, except any process involving the use of Chromated Copper arsenate (CCA) for pressure treating wood is not permitted.

2.2 PLYWOOD

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

1. APA rated Exposure 1 or Exterior; panel grade CD or better.
2. Wall sheathing:
 - a. Minimum 15 mm (19/32 inch) thick plywood, unless specified otherwise.
3. Ceiling sheathing:
Unless required by Structural, provide:
 - a. Minimum 18 mm (23/32 inch) thick plywood, unless specified otherwise.

2.3 STRUCTURAL-USE PANELS

- A. Comply with APA.
- B. Bearing the mark of a recognized association or independent agency that maintains continuing control over quality of panel which identifies compliance by end use, Span Rating, and exposure durability classification.
- C. Wall and Ceiling Sheathing:
 1. APA Rated sheathing panels, durability classification of Exposure 1 or Exterior Span Rating of 16/0 or greater for supports 400 mm (16 inches) on center and 24/0 or greater for supports 600 mm (24 inches) on center.

2.4 ROUGH HARDWARE AND ADHESIVES:

- A. Anchor Bolts:
 1. ASME B18.2.1 and ANSI B18.2.2 galvanized, 13 mm (1/2 inch) unless shown otherwise.
 2. Extend at least 200 mm (8 inches) into masonry or concrete with ends bent 50 mm (2 inches).
- B. Miscellaneous Bolts: Expansion Bolts: C1D, A-A-55615; lag bolt, long enough to extend at least 65 mm (2-1/2 inches) into masonry or concrete. Use 13 mm (1/2 inch) bolt unless shown otherwise.
- C. Washers
 1. ASTM F844.
 2. Use zinc or cadmium coated steel or cast iron for washers exposed to weather.
- D. Screws:
 1. Wood to Wood: ANSI B18.6.1 or ASTM C1002.
 2. Wood to Steel: ASTM C954, or ASTM C1002.

E. Nails:

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

PART 3 - EXECUTION

3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:

- A. Conform to applicable requirements of the following:
1. AFPA National Design Specification for Wood Construction for timber connectors.
 2. AITC Timber Construction Manual for heavy timber construction.
 3. AFPA WCD-number 1, Manual for House Framing for nailing and framing unless specified otherwise.
 4. APA for installation of plywood or structural use panels.
 5. ASTM F 499 for wood underlayment.
 6. TPI for metal plate connected wood trusses.
- B. Fasteners:
1. Nails.
 - a. Nail in accordance with the Recommended Nailing Schedule as specified in AFPA Manual for House Framing where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.
 - b. Use special nails with framing connectors.
 - c. For sheathing, select length of nails sufficient to extend 25 mm (1 inch) into supports.

- d. Use eight penny or larger nails for nailing through 25 mm (1 inch) thick lumber and for toe nailing 50 mm (2 inch) thick lumber.
 - e. Use 16 penny or larger nails for nailing through 50 mm (2 inch) thick lumber.
2. Bolts:
- a. Fit bolt heads and nuts bearing on wood with washers.
 - b. Countersink bolt heads flush with the surface of nailers.
 - c. Embed in concrete and solid masonry or use expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.
 - d. Use toggle bolts to hollow masonry or sheet metal.
 - e. Use bolts to steel over 2.84 mm (0.112 inch, 11 gage) in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 600 mm (24 inch) intervals between end bolts. Use clips to beam flanges.
3. Drill Screws to steel less than 2.84 mm (0.112 inch) thick.
- a. ASTM C1002 for steel less than 0.84 mm (0.033 inch) thick.
 - b. ASTM C 954 for steel over 0.84 mm (0.033 inch) thick.
4. Power actuated drive pins may be used where practical to anchor to solid masonry, concrete, or steel.
5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Use metal plugs, inserts or similar fastening.
6. Screws to Join Wood:
- a. Where shown or option to nails.
 - b. ASTM C1002, sized to provide not less than 25 mm (1 inch) penetration into anchorage member.
 - c. Spaced same as nails.
- C. Set sills or plates level in full bed of mortar on masonry or concrete walls.
- 1. Space anchor bolts 1200 mm (4 feet) on centers between ends and within 150 mm (6 inches) of end. Stagger bolts from side to side on plates over 175 mm (7 inches) in width.
 - 2. Use shims of slate, tile or similar approved material to level wood members resting on concrete or masonry. Do not use wood shims or wedges.

3. Closely fit, and set to required lines.
- D. Cut notch, or bore in accordance with NFPA Manual for House-Framing for passage of ducts wires, bolts, pipes, conduits and to accommodate other work. Repair or replace miscut, misfit or damaged work.
- E. Blocking Nailers, and Furring:
 1. Install furring, blocking, nailers, and grounds where shown.
 2. Use longest lengths practicable.
 3. Use fire retardant treated wood blocking.
 4. 4. Layers of Blocking or Plates:
 - a. Stagger end joints between upper and lower pieces.
 - b. Nail at ends and not over 600 mm (24 inches) between ends.
 - c. Stagger nails from side to side of wood member over 125 mm (5 inches) in width.
 5. Unless otherwise shown, Fabricate roof edge vent strips with 6 mm by 6 mm (1/4 inch by 1/4 inch) notches, 100 mm (4 inches) on center, aligned to allow for venting of insulating concrete and venting base sheet.
 6. Unless otherwise shown, use wall furring 25 mm by 75 mm (1 inch by 3 inch) continuous wood strips installed plumb on walls, using wood shims where necessary so face of furring forms a true, even plane. Space furring not over 400 mm (16 inches on centers, butt joints over bearings and rigidly secure in place. Anchor furring on 400 mm (16 inches) centers.
- F. Sheathing (wall, ceiling):
 1. Use plywood or structural-use panels for sheathing.
 2. Lay panels with joints staggered, with edge and ends 3 mm (1/8 inch) apart and nailed over bearings as specified.
 3. Set nails not less than 9 mm (3/8 inch) from edges.
 4. Install 50 mm by 100 mm (2 inch by 4 inch) blocking spiked between joists, rafters and studs to support edge or end joints of panels.
 5. Match and align sheathing which is an extension of work in place to existing.

- - - E N D - - -

SECTION 07 56 00
FLUID-APPLIED FLASHING

PART 1 - GENERAL

1.1 DESCRIPTION

Provide new fluid-applied roofing and flashing to protect new and exist penetrations in existing roof. Removal of existing roofing is specified in other section.

1.2 RELATED WORK

N/A.

1.3 QUALITY CONTROL

- A. Work shall be performed by installer approved in writing by roofing material manufacturer.
- B. Installation shall comply with printed instructions of roofing materials manufacturer.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Certificates:
 - 1. Installer approval.
 - 2. Certificate stating that material utilized on the job will be of the same formulation as materials covered by the test report.
- C. Manufacturer's Literature and Data:
 - 1. Roofing system materials giving physical properties, wet mil thickness in relation to dry mil thickness, and other related information.
 - 2. Manufacturer's printed instructions for application of roofing materials to be installed.
- D. Test Reports: Test report from an independent commercial testing laboratory showing that neoprene and hypalon materials meet specified requirements and wind load requirement of area of roof being installed.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

- B. Observe precautions appropriate to flammable materials and "safety notes" included in roofing material manufacturer's printed instructions to installer before, during, and immediately following application of these materials.
- C. Storage: Store closed containers in a cool, dry area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis. Do not store resins at temperatures below 32°F (0°C) or above 85°F (29°C). Keep away from open fire, flame or any ignition source. Store in a well ventilated area.
- D. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Keep away from open fire, flame, or any ignition source. Vapors may form explosive mixtures with air. Avoid skin and eye contact with this material. Avoid breathing fumes when above the Threshold Limit Value (TLV). Do not eat, drink, or smoke in areas where materials are stored or applied.
- E. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above shall be automatically rejected, removed and replaced at the Contractor's expense.

1.6 JOB CONDITIONS

- A. Work shall proceed only on dry surfaces free of water, surface condensation, rain, snow, ice, and frost.
- B. Do not proceed when temperature of surfaces to receive roofing and flashing, is lower than 5°C (40 degrees F).
- C. Complete work on roof deck and install penetrations and projections through roof deck before roofing and flashing work as this section is applied.

1.7 WARRANTY

Roofing system is subject to terms to "Warranty of Construction", FAR clause 52.246-21, except that warranty period is extended to two years.

1.8 APPLICABLE PUBLICATIONS

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

- B. References in these specifications to standards, test methods and codes, are implied to mean the latest edition of each such standard adopted. The following is an abbreviated list of associations, institutions, and societies which may be used as references throughout these specifications.

ASTM American Society for Testing and Materials Philadelphia, PA
FM Factory Mutual Engineering and Research Norwood, MA
NRCA National Roofing Contractors Association Rosemont, IL
CERTA Certified Roofing Torch Applicator Program National Roofing Contractors Association Rosemont, IL
Midwest Roofing Contractors Association Laurence, KS
OSHA Occupational Safety and Health Administration Washington, DC
UL Underwriters Laboratories Northbrook, IL
ACI American Concrete Institute Hills, MI
ICRI International Concrete Repair Institute Des Plaines, IL

PART 2 - PRODUCTS

2.1 ROOFING MATERIALS

The roofing products listed below are from Siplast Inc. to serve as the minimum level of quality required. Other manufacturers are also acceptable provided that the proposed systems will meet or exceed the requirements listed here.

2.2 FLUID APPLIED FLASHING

- A. Asphalt Primer: An asphalt, solvent blend conforming to ASTM D 41 Type I or II requirements and meeting local VOC regulations.
> PA-1125 Asphalt Primer by Siplast; Irving, TX
- B. Base Sheet for Securement to Nailable Deck Substrates: A fiberglass reinforced, asphalt coated sheet with a polyolefin film backing, having a minimum weight of 20 lb/sq. The sheet shall conform to ASTM D 4601, Type II requirements.
> Parabase FS, by Siplast; Irving, TX
- C. Modified Bitumen Ply Sheet: A torch grade, fiberglass reinforced, SBS modified bitumen coated sheet having a minimum weight of 76 lb/sq. The top surface of the modified bitumen ply sheet shall be coated with a proprietary acrylic coating.
> Paradiene 20 TG P, by Siplast; Irving, TX

- D. Elastomeric Sealant: A moisture-curing, non-slump elastomeric sealant designed for roofing applications. The sealant shall be approved by the roof membrane manufacturer for use in conjunction with the roof membrane materials. Acceptable types are as follows:
- > PS-304 Elastomeric Sealant by Siplast; Irving, TX
- E. Cleaner/Solvent: A clear solvent used to prepare metal and plastic surfaces prior to application of the catalyzed resin flashing membranes and to reactivate transition areas of in-place catalyzed resin flashing membranes at tie-ins and between staged coats of resin.
- > Pro Prep by Siplast; Irving, TX
- F. PMMA Primers
1. PMMA Primer for Concrete/Masonry/Wood/Plywood Substrates: A two-component, PMMA-based primer for use over concrete, concrete repair materials, masonry substrates and wood/plywood substrates.
 - > Pro Primer W by Siplast; Irving, TX
 2. PMMA Primer for Asphaltic Substrates: A two-component, PMMA-based primer for use over asphaltic materials.
 - > Pro Primer R by Siplast; Irving, TX
- G. Preparation Paste: A multi-component, PMMA based paste used for remediation of depressions in substrate surfaces or other irregularities.
- > Pro Paste Resin by Siplast; Irving, TX
- H. Reinforced PMMA Membrane/Flashing System Components
1. Catalyst: A reactive agent used to induce curing of polymethylmethacrylate (PMMA) resins.
 - > Pro Catalyst by Siplast; Irving, TX
 2. Resin for Flashing Applications: A multi-component, flexible, polymethylmethacrylate (PMMA) based resin combined with a thixotropic agent for use in combination with fleece fabric to form a monolithic, reinforced flashing membrane.
 - > Parapro 123 Flashing Resin by Siplast; Irving, TX
 3. Resin for Field Membrane Construction: A multi-component, flexible, polymethylmethacrylate (PMMA) based resin for use in combination with fleece fabric to form a monolithic, reinforced roofing membrane.
 - > Parapro Roof Resin by Siplast; Irving, TX

4. Fleece for Membrane and Flashing Reinforcement: A non-woven, 110 g/m², needle-punched polyester fabric reinforcement as supplied by the membrane system manufacturer.
> Pro Fleece by Siplast; Irving, TX
5. Thixotropic Agent: A liquid additive used to increase the viscosity of the PMMA resin products, allowing the resins to be applied over sloped areas.
> Pro Thixo by Siplast; Irving, TX

I. Fasteners

1. Base Sheet Fasteners: Base sheet fasteners shall be approved by the manufacturer of the primary roofing products. Acceptable base sheet fasteners for specific substrate types are listed below.
 - a) Lightweight Concrete Substrates
 - A single unit, precision formed, electro zinc coated steel fastener having a 2.7 inch diameter rib reinforced cap and 1.7 inch long rectangular legs, designed to expand when fully driven into the lightweight concrete. Fasteners for lightweight concrete shall meet FM Standard 4470 requirements for corrosion resistance.
 - > Zono-tite Base Sheet Fasteners by Siplast; Irving, TX2.3
- REINFORCING TAPE

PART 3 - EXECUTION

3.1 SUBSTRATE EXAMINATION/PREPARATION

- A. GENERAL: Ensure that substrates are free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, bituminous products, release agents, laitance, paint, loose particles/friable matter, rust or any other material that would be detrimental to adhesion of the catalyzed primer and/or resin to the substrate. Some surfaces may require scarifying, sandblasting, or grinding to achieve a suitable substrate. Wipe surfaces with a clean cloth saturated with the specified preparation liquid to remove grease, oils or dust that may affect adhesion and to cured pmma surfaces to receive a subsequent coat of resin.
- B. Lightweight insulating concrete patching: perform all patching and repairing of insulating concrete using zono-patch or other materials approved by the lightweight insulating concrete manufacturer.
- C. Preparation of existing concrete/masonry substrates to receive resin materials: existing concrete substrates shall have a minimum hardness of 3,500 psi (24 n/mm²). Shot-blast or scarify concrete or masonry surfaces to provide a sound substrate free from laitance and residue from bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion. Prepare the concrete surface to generate a concrete surface profile of csp-2 to csp-4 as defined by the icri.
- D. Static crack and cold joint preparation: prime cracks and joints with the specified pmma primer and fill cracks and joints using the specified preparation paste prior to membrane/flashing application. Commence membrane and flashing application immediately following catalyzation of the preparation paste.
- E. Concrete substrate repair: prime areas of the concrete substrate intended for repair using the specified pmma primer. Fiil the areas using the specified paste or repair mortar and allow to catalyze. Follow the paste or repair mortar manufacturer's published minimum and maximum product thickness limitations per lift.
- F. Preparation of nailable substrates

1. Base sheet securement: lay the specified base sheet over the entire area to be roofed, lapping sides 3 inches and ends 6 inches. Using the specified fasteners, fasten each sheet every 7 1/2 inches through laps and stagger fasten the remainder of the sheet in 2 rows on nominal 12 inch centers with fasteners in each row on 10 inch centers. Increase the fastening pattern at the perimeter by 70% and the corners by 160%. Perimeter and corner areas are identified on the roof plan.
 - G. Ply sheet application: bond the modified bitumen ply sheet to the prepared substrate, utilizing minimum 3 inch side and end laps. Apply each sheet directly behind the torch applicator. Cut a dog ear angle at the end laps on overlapping selvage edges. Using a clean trowel, apply pressure to top seal t-laps immediately following sheet application. Stagger end laps a minimum of 3 feet.
- 3.2 MIXING OF RESIN PRODUCTS
- A. Preparation/mixing/catalyzing aggregate-filled resin products: pour the entire desired quantity of resin into a clean container and slowly add the pre-measured quantity of aggregate using a spiral mixer or mixing paddle, stirring the mixture for the time period specified by the resin manufacturer. If catalyst is not a component of the aggregate mixture, calculate the amount of catalyst powder needed using the manufacturer's guidelines and add the pre-measured catalyst to the resin/aggregate mixture. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. Ensure that air is not entrained into the product during the mixing process. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before expiration of resin pot life.

- B. Preparation/mixing/catalyzing resin products: pour the desired quantity of resin into a clean container and using a spiral mixer or mixing paddle, stir the liquid for the time period specified by the resin manufacturer. Calculate the amount of catalyst powder needed using the manufacturer's guidelines and add the pre-measured catalyst to the resin component. Mix again for the time period specified by the resin manufacturer, ensuring that the product is free from swirls and bubbles. Ensure that air is not entrained into the product during the mixing process. To avoid aeration, do not use a spiral mixer unless the spiral section of the mixer can be fully contained in the liquid during the mixing process. Mix only enough product to ensure that it can be applied before expiration of resin pot life.

3.3 PREPARATION PASTE AND PRIMER MIXING/APPLICATION

- A. Primer application: apply primer resin using a roller or brush at the minimum rate specified by the primer manufacturer over poured reinforced concrete substrates. Apply primer resin using a roller or brush at the increased rate specified by the primer manufacturer over densdeck, densdeck prime, and granule surfaced membrane substrates. Increase application rates over other absorbent substrates. Do not let resin pool or pond. Do not under-apply or over-apply primers as this may interfere with proper primer catalyzation. Make allowances for saturation of roller covers and application equipment.
- B. Paste application: allow the primer to set and apply catalyzed preparation paste using a trowel.

3.4 FLASHING AND FIELD MEMBRANE APPLICATION

- A. Base flashing application
1. Using masking tape, mask the perimeter of the area to receive the flashing system. Apply resin primer to substrates requiring additional preparation and allow primer to set.
 2. Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.

3. Apply an even, generous base coat of flashing resin using a roller at the minimum rate specified by the resin manufacturer to prepared surfaces requiring flashing coverage. Work the fleece into the wet, catalyzed resin using a brush or roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch (5 cm) and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin at the minimum rate specified by the resin manufacturer immediately following embedment of the fleece, ensuring full saturation of the fleece. Ensure that the flashing resin is applied to extend a 0.25 inch (6 mm) beyond the fleece. Remove the tape before the catalyzed resin sets. Make allowances for saturation of roller covers and application equipment.
4. Should work be interrupted for more than 12 hours or the surface of the catalyzed resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent. Allow the surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing work.

B. Field membrane application

1. Using the specified cleaner/solvent, wipe flashing membrane surfaces to be lapped with field membrane. Allow the surface to dry for a minimum 20 minutes before continuing work.
2. Apply an even, generous base coat of field membrane resin using a roller at the minimum rate specified by the resin manufacturer to prepared surfaces. Work the fleece into the wet, catalyzed resin using a roller to fully embed the fleece in the resin and remove trapped air. Lap fleece layers a minimum of 2 inch (5 cm) and apply an additional coat of catalyzed resin between layers of overlapping fleece. Again using a roller, apply an even top coat of catalyzed resin at the minimum rate specified by the resin manufacturer immediately following embedment of the fleece, ensuring full saturation of the fleece. Make allowances for saturation of roller covers and application equipment. Allow 2 hours cure time prior to exposing the membrane to foot traffic.

3.05 FIELD QUALITY CONTROL, FIELD TESTING AND INSPECTIONS

- A. Field testing: architect shall select roofing and flashing areas to be tested as soon as a representative portion of the project has been re-roofed, re-flashed, with penetrations corrected and perimeter sealants have been applied and cured. Provide test to be modified astm e1105 check for water penetration resistance. Test areas shall not evidence any water on the interior of the system or surrounding construction. Roofing and flashing sections not meeting specified performance requirements and units having deficiencies will be corrected at no additional cost to the owner and as part of the original contract amount. Testing to be performed within 10 days of a significant rain event.
- B. Site condition: leave all areas around job site free of debris, roofing materials, equipment and related items after completion of job.
- C. Notification of completion: notify the manufacturer by means of manufacturer's printed notification of completion form of job completion in order to schedule a final inspection date.
- D. Final inspection
- E. Post-installation meeting: hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.
- F. Issuance of the guarantee: complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

3.5 PROTECTION AND CLEAN UP

- A. Keep completed roofing system free of non essential traffic and unrelated work until at least 48 hours after completion of roofing application.

- B. Provide temporary support, such as insulation board, for materials and equipment stored on roof during application.
- C. Protect adjacent construction from disfiguration by run, spillage or overspray, and repair work defaced in this manner.
- D. Remove tools, equipment and surplus materials and clear roof area of debris on completion of work.

3.6 REPAIRS

Repair damage to roofing and flashing before work is complete to insure a continuous waterproof membrane complying with these specifications.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

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. Spray applied fireproofing: Section 07 81 00, APPLIED FIREPROOFING
- B. Fire and smoke damper assemblies in ductwork: Section 23 31 00, HVAC DUCTS AND CASINGS; Section 23 37 00, AIR OUTLETS AND INLETS.

1.3 SUBMITTALS

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

Firestopping work subject to the terms of the Article "Warranty of Construction", FAR clause 52.246-21, except extend the warranty period to five years.

1.6 QUALITY ASSURANCE

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):
 - E84-08a.....Surface Burning Characteristics of Building Materials
 - E814-08b.....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
 - 1479-03.....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 100 mm (4 in) nominal pipe or 0.01 m² (16 sq. in.) 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 to 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

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 150 mm (six 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 CLEAN-UP 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 Resident Engineer.
- C. Clean up spills of liquid type materials.

- - - E N D - - -

SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION:

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. Firestopping penetrations: Section 07 84 00, FIRESTOPPING.
- B. Sound rated gypsum partitions/sound sealants: Section 09 29 00, GYPSUM BOARD.
- C. 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. Product Testing: Obtain test results from a qualified testing agency based on testing current sealant formulations within a 12-month period.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
 - 2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920, and where applicable, to other standard test methods.
 - 3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
- D. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates in accordance with sealant manufacturer's recommendations:
 - 1. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.

- b. Each type of non-elastomeric sealant and joint substrate indicated.
- 2. Notify Resident Engineer seven days in advance of dates and times when test joints will be erected.
- E. VOC: Acrylic latex and Silicon sealants shall have less than 50g/l VOC content.
- F. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution:
 - 1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this section.

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. Cured samples of exposed sealants for each color where required to match adjacent material.
- D. 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 4.4 °C (40 °F).
 - b. When joint substrates are wet.
- B. Joint-Width Conditions:
 - 1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions:

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

1.6 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 5° C (40° F) or less
than 32° C (90° 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 exterior 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 two 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.
C612-04e1.....Mineral Fiber Block and Board Thermal
Insulation.
C717-08.....Standard Terminology of Building Seals and
Sealants.
C834-05.....Latex Sealants.
C919-08.....Use of Sealants in Acoustical Applications.
C920-08.....Elastomeric Joint Sealants.

C1021-08.....Laboratories Engaged in Testing of Building
Sealants.
C1193-05a.....Standard Guide for Use of Joint Sealants.
C1330-02 (2007).....Cylindrical Sealant Backing for Use with Cold
Liquid Applied Sealants.
D1056-07.....Specification for Flexible Cellular Materials-
Sponge or Expanded Rubber.
E84-08a.....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 1200 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, acetoxycure.
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.

J. S-10:

1. ASTM C920, coal tar extended fuel resistance polyurethane.
2. Type M/S.
3. Class 25.

4. Grade P/NS.
5. Shore A hardness of 15-20.

K. S-11:

1. ASTM C920 polyurethane.
2. Type M/S.
3. Class 25.
4. Grade P/NS.
5. Shore A hardness of 35 to 50.

L. S-12:

1. ASTM C920, polyurethane.
2. Type M/S.
3. Class 25, joint movement range of plus or minus 50 percent.
4. Grade P/NS.
5. Shore A hardness of 25 to 50.

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 32° C (minus 26° 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-NON POUROUS SURFACES:

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 non-porous surfaces and formulated to promote adhesion of sealant and substrates.

PART 3 - EXECUTION

3.1 INSPECTION:

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

3.2 PREPARATIONS:

- A. Prepare joints in accordance with manufacturer's instructions and SWRI.
- 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 3 mm (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 6 mm (1/4 inch), sealant depth equal to width.

B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (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 5° C and 38° C (40° and 100° 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 6 mm (1/4 inch) minimum bead of sealant each side of runners (tracks), including those used at partition intersections with dissimilar wall construction.

2. Coordinate with application of gypsum board to install sealant immediately prior to application of gypsum board.
3. Partition intersections: Seal edges of face layer of gypsum board abutting intersecting partitions, before taping and finishing or application of veneer plaster-joint reinforcing.
4. Openings: Apply a 6 mm (1/4 inch) bead of sealant around all 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.

3.6 FIELD QUALITY CONTROL:

- A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates as recommended by sealant manufacturer:
 1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform 10 tests for first 300 m (1000 feet) of joint length for each type of elastomeric sealant and joint substrate.
 - b. Perform one test for each 300 m (1000 feet) of joint length thereafter or one test per each floor per elevation.
- B. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
- C. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

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. Exterior Building Joints, Horizontal and Vertical:
 1. Metal to Metal: Type S-1, S-2

2. Metal to Masonry or Stone: Type S-1
 3. Masonry to Masonry or Stone: Type S-1
 4. Stone to Stone: Type S-1
 5. Cast Stone to Cast Stone: Type S-1
 6. Threshold Setting Bed: Type S-1, S-3, S-4
 7. Masonry Expansion and Control Joints: Type S-6
 8. Wood to Masonry: Type S-1
- B. Metal Reglets and Flashings:
1. Flashings to Wall: Type S-6
 2. Metal to Metal: Type S-6
- C. Sanitary Joints:
1. Walls to Plumbing Fixtures: Type S-9
 2. Counter Tops to Walls: Type S-9
 3. Pipe Penetrations: Type S-9
- D. Horizontal Traffic Joints:
1. Concrete Paving, Unit Pavers: Type S-11 or S-12
 2. Garage/Parking Decks: Type S-10
- E. High Temperature Joints over 204 degrees C (400 degrees F):
1. Exhaust Pipes, Flues, Breech Stacks: Type S-7 or S-8
- F. Interior Caulking:
1. Typical Narrow Joint 6 mm, (1/4 inch) or less at Walls and Adjacent Components: Types C-1, C-2 and C-3.
 2. Perimeter of Doors, Windows, Access Panels which Adjoin Concrete or Masonry Surfaces: Types C-1, C-2 and C-3.
 3. Joints at Masonry Walls and Columns, Piers, Concrete Walls or Exterior Walls: Types C-1, C-2 and C-3.
 4. Perimeter of Lead Faced Control Windows and Plaster or Gypsum Wallboard Walls: Types C-1, C-2 and C-3.
 5. Exposed Isolation Joints at Top of Full Height Walls: Types C-1, C-2 and C-3.
 6. Exposed Acoustical Joint at Sound Rated Partitions Type C-2.
 7. Concealed Acoustic Sealant Type S-4, C-1, C-2 and C-3.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 11 13
HOLLOW METAL DOOR FRAMES

PART 1 - GENERAL

1.1 DESCRIPTION

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

1.2 RELATED WORK

- A. Section 08 14 00, INTERIOR WOOD DOORS
- B. Door Hardware: Section 08 71 00, DOOR HARDWARE.

1.3 TESTING

An independent testing laboratory shall perform testing.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturers Literature and Data

1.5 SHIPMENT

- A. Prior to shipment label each 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 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. Federal Specifications (Fed. Spec.):
L-S-125B.....Screening, Insect, Nonmetallic
- C. Door and Hardware Institute (DHI):
A115 Series.....Steel Door and Frame Preparation for Hardware,
Series A115.1 through A115.17 (Dates Vary)
- D. Steel Door Institute (SDI):
113.....Apparent Thermal Performance for Steel Door and
Frame Assemblies
114.....Acoustical Performance for Steel Door and Frame
Assemblies
A250.8-03.....Standard Steel Doors and Frames

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

- A167-99(R2004).....Stainless and Heat-Resisting Chromium-Nickel
Steel Plate, Sheet, and Strip
- A568/A568M-07a.....Steel, Sheet, Carbon, and High-Strength, Low-
alloy, Hot-Rolled and Cold-Rolled
- A1008-08a.....Steel, sheet, Cold-Rolled, Carbon, Structural,
High Strength Low Alloy and High Strength Low
Alloy with Improved Formability
- B209/209M-07.....Aluminum and Aluminum-Alloy Sheet and Plate
- B221/221M-08.....Aluminum and Aluminum-Alloy Extruded Bars,
Rods, Wire, Profiles and Tubes
- D1621-04a.....Compressive Properties of Rigid Cellular
Plastics
- D3656-07.....Insect Screening and Louver Cloth Woven from
Vinyl Coated Glass Yarns
- E90-04.....Laboratory Measurement of Airborne Sound
Transmission Loss of Building Partitions

F. The National Association Architectural Metal Manufacturers (NAAMM):
Metal Finishes Manual (1988 Edition)

G. National Fire Protection Association (NFPA):

- 80-08.....Fire Doors and Fire Windows

H. Underwriters Laboratories, Inc. (UL):

- Fire Resistance Directory

I. Intertek Testing Services (ITS):

- Certifications Listings...Latest Edition

J. Factory Mutual System (FM):

- Approval Guide

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: ASTM A167, Type 302 or 304; finish, NAAMM Number 4.
- B. Sheet Steel: ASTM A1008, cold-rolled for panels (face sheets) of doors.
- C. Anchors, Fastenings and Accessories: Fastenings anchors, clips
connecting members and sleeves from zinc coated steel.
- D. Aluminum Sheet: ASTM B209/209M.
- E. Aluminum, Extruded: ASTM B221/221M.
- F. Prime Paint: Paint that meets or exceeds the requirements of A250.8.

2.2 FABRICATION GENERAL

- A. General:

1. SDI A250.8, 1.3 mm (0.053 inch) thick sheet steel, types and styles as shown or scheduled.
 2. Knocked-down frames are not acceptable.
- B. Reinforcement and Covers:
1. SDI A250.8 for, minimum thickness of steel reinforcement welded to back of frames.
 2. Provide mortar guards securely fastened to back of hardware reinforcements except on lead-lined frames.
 3. Where concealed door closers are installed within the head of the door frames, prepare frames for closers and provide 1 mm (0.042 inch) thick steel removable stop sections for access to concealed face plates and control valves, except when cover plates are furnished with closer.
- C. Terminated Stops: SDI A250.8.
- D. Glazed Openings and Panel Opening:
- 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. Two piece frames:
- a. One piece unequal leg finished rough buck sub-frames as shown, drilled for anchor bolts.
 - b. Unequal leg finished frames formed to fit subframes and secured to subframe legs with countersunk, flat head screws, spaced 300 mm (12 inches) on center at head and jams on each side.
 - c. Preassemble at factory for alignment.
- F. Frame Anchors:
1. Floor anchors:
 - a. Where floor fills occur, provide extension type floor anchors to compensate for depth of fill.
 - b. At bottom of jamb use 1.3 mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive two 6 mm (1/4 inch) floor bolts. Use 50 mm x 50 mm (2 inch by 2 inch) 9 mm by (3/8 inch) clip angle for lead lined frames, drilled for 9 mm (3/8 inch) floor bolts.
 - c. Where mullions occur, provide 2.3 mm (0.093 inch) thick steel channel anchors, drilled for two 6 mm (1/4 inch) floor bolts and frame anchor screws.
 - d. Where sill sections occur, provide continuous 1 mm (0.042 inch) thick steel rough bucks drilled for 6 mm (1/4 inch) floor bolts and frame anchor screws. Space floor bolts at 50 mm (2 inches) on center.
 2. Jamb anchors:
 - a. Locate anchors on jams near top and bottom of each frame, and at intermediate points not over 600 mm (24 inches) apart, except for

- fire rated frames space anchors as required by labeling authority.
- b. Form jamb anchors of not less than 1 mm (0.042 inch) thick steel unless otherwise specified.
 - c. Anchors set in masonry: Use adjustable anchors designed for friction fit against the frame and for extension into the masonry not less than 250 mm (10 inches). Use one of following type:
 - 1) Wire loop type of 5 mm (3/16 inch) diameter wire.
 - 2) T-shape or strap and stirrup type of corrugated or perforated sheet steel.
 - d. 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.
 - e. Anchors for frames set in prepared openings:
 - 1) Steel pipe spacers with 6 mm (1/4 inch) inside diameter welded to plate reinforcing at jamb stops or hat shaped formed strap spacers, 50 mm (2 inches) wide, welded to jamb near stop.
 - 2) Drill jamb stop and strap spacers for 6 mm (1/4 inch) flat head bolts to pass thru frame and spacers.
 - 3) Two piece frames: Subframe or rough buck drilled for 6 mm (1/4 inch) bolts.
 - f. Anchors for observation windows and other continuous frames set in stud partitions.
 - 1) In addition to jamb anchors, weld clip anchors to sills and heads of continuous frames over 1200 mm (4 feet) long.
 - 2) Anchors spaced 600 mm (24 inches) on centers maximum.
 - g. Modify frame anchors to fit special frame and wall construction and provide special anchors where shown or required.

2.3 SHOP PAINTING

SDI A250.8.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Plumb, align and brace frames securely until permanent anchors are set.
 - 1. Use triangular bracing near each corner on both sides of frames with temporary wood spreaders at midpoint.
 - 2. Use wood spreaders at bottom of frame if the shipping spreader is removed.
 - 3. Protect frame from accidental abuse.
 - 4. Where construction will permit concealment, leave the shipping spreaders in place after installation, otherwise remove the spreaders after the frames are set and anchored.

5. Remove wood spreaders and braces only after the walls are built and jamb anchors are secured.

B. Floor Anchors:

1. Anchor the bottom of door frames to floor with two 6 mm (1/4 inch) diameter expansion bolts. Use 9 mm (3/8 inch) bolts on lead lined frames.
2. Power actuated drive pins may be used to secure frame anchors to concrete floors.

C. Jamb Anchors:

1. Anchors in masonry walls: Embed anchors in mortar. Fill space between frame and masonry wall with grout or mortar as walls are built.
2. Coat frame back with a bituminous coating prior to lining of grout filling in masonry walls.
3. Secure anchors to sides of studs with two fasteners through anchor tabs. Use steel drill screws to steel studs.
4. Frames set in prepared openings of masonry or concrete: Expansion bolt to wall with 6 mm (1/4 inch) expansion bolts through spacers. Where subframes or rough bucks are used, 6 mm (1/4 inch) expansion bolts on 600 mm (24 inch) centers or power activated drive pins 600 mm (24 inches) on centers. Secure two piece frames to subframe or rough buck with machine screws on both faces.

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

- E. Frames for Sound Rated Doors: Coordinate to line frames for sound rated doors with insulation.

- F. Overhead Bracing (Lead Lined Frames): Where jamb extensions extend to structure above, anchor clip angles with not less than two, 9 mm (3/8 inch) expansion bolts or power actuated drive pins to concrete slab. Weld to steel overhead members.

3.2 INSTALLATION OF DOORS AND APPLICATION OF HARDWARE

Install door frame hardware as specified in Sections: Section 08 11 13, HOLLOW METAL FRAMES; Section 08 14 00, WOOD DOORS, Section 08 71 00 DOOR HARDWARE.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 14 00
INTERIOR WOOD DOORS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies interior doors with veneer, prefinish, prefit option.
- B. Unless noted as door to remain, all doors listed are new doors.
- C. Refer to finish schedule in drawings for additional information.

1.2 RELATED WORK

- A. Metal door frames: Section 08 11 13, HOLLOW METAL DOOR FRAMES.
- B. Door hardware including hardware location (height): Section 08 71 00, DOOR HARDWARE.
- C. Installation of doors and hardware: Section 08 11 13, HOLLOW METAL DOOR FRAMES, Section 08 14 00, WOOD DOORS, or Section 08 71 00, DOOR HARDWARE.
- D. Door Protection: Section 10 26 00, WALL AND DOOR PROTECTION
- E. Lead Lined Wood Doors: Section 13 49 00, RADIATION PROTECTION

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
 - 1. Veneer sample 200 mm (8 inch) by 275 mm (11 inch) by 6 mm (1/4 inch) showing specified wood species sanded to receive a transparent finish. Factory finish veneer sample where the prefinished option is accepted.
- 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, louvers, sound gasketing and pertinent details.
 - 3. Provide information concerning specific requirements not included in the manufacturer's literature and data submittal.
- D. Laboratory Test Reports:
 - 1. Screw holding capacity test report in accordance with WDMA TM-10.
 - 2. Split resistance test report in accordance with WDMA TM-5.
 - 3. Cycle/Slam test report in accordance with WDMA TM-7.
 - 4. Hinge-Loading test report in accordance with WDMA TM-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 mill polyethylene bags or cardboard packages which shall remain unbroken during delivery and storage.
- B. Store in accordance with WDMA I.S.1-A, J-1 Job Site Information.
- C. Label package for door opening where used.

1.6 APPLICABLE PUBLICATIONS

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

- B. Window and Door Manufacturers Association (WDMA):
- I.S.1-A-04.....Architectural Wood Flush Doors
 - I.S.4-07a.....Water-Repellent Preservative Non-Pressure
Treatment for Millwork
 - I.S.6-08.....Wood Stile and Rail Doors
 - I.S.6-A-01.....Architectural Stile and Rail Doors
 - TM-5-90.....Test Method to Determine the Split Resistance
of Stile Edges of Wood Doors
 - TM-6-08.....Adhesive Bond Durability Test Method
 - TM-7-08.....Cycle-Slam Test Method
 - TM-8-08.....Hinge Loading Resistance Test Method
 - TM-10-08.....Screw Holding Test Method
- C. National Fire Protection Association (NFPA):
- 80-07.....Fire Doors and Windows
 - 252-03.....Fire Tests of Door Assemblies
- D. ASTM International (ASTM):
- E90-04.....Fire Tests of Door Assemblies

PART 2 - PRODUCTS

2.1 FLUSH DOORS

A. General:

Provide doors with wood veneer & finish per drawings:

1. Meet requirements of WDMA I.S.1-A, Extra Heavy Duty.
2. Adhesive: Type II
3. Thickness: 45 mm (1-3/4 inches) unless otherwise shown or specified.

B. Face Veneer:

1. In accordance with NWWDA I.S.1-A.
2. One species throughout the project unless scheduled or otherwise shown.
3. For transparent finishes:
 - a. In existing buildings, where doors are required to have transparent finish, use wood species and grade of face veneers to match adjacent existing doors.
4. Factory sand doors for finishing.

C. Wood for stops, louvers, muntins and moldings of flush doors required to have transparent finish:

1. Solid Wood of same species as face veneer, except maple may be used on birch doors.
2. Glazing:
 - a. On non-labeled doors use applied wood stops nailed tight on room side and attached on opposite side with flathead, countersunk wood screws, spaced approximately 125 mm (5 inches) on centers.

2.3 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.
- C. Flush doors to receive transparent finish (in addition to being prefit) shall be factory finished as follows:
 1. WDMA I.S.1A Section F-3 specification for System TR-4, Conversion Varnish or System TR-5, Catalyzed Vinyl.

2.4 IDENTIFICATION MARK:

- A. On top edge of door.

- B. Either a stamp, brand or other indelible mark, giving manufacturer's name, door's trade name, construction of door, code date of manufacture and quality.
- C. Accompanied by either of the following additional requirements:
 - 1. An identification mark or a separate certification including name of inspection organization.
 - 2. Identification of standards for door, including glue type.
 - 3. Identification of veneer and quality certification.
 - 4. Identification of preservative treatment for stile and rail doors.

2.5 SEALING:

Give top and bottom edge of doors two coats of catalyzed polyurethane or water resistant sealer before sealing in shipping containers.

2.3 LOUVERS

- A. General:
 - 1. Sight proof type with stationary blades the full thickness of the door.
 - 2. Design lightproof louvers to exclude passage of light but permit free ventilation.
- B. Fabrication:
 - 1. Steel louvers 0.8 mm (0.032 inch) thick for interior doors.
 - 2. Fabricate louvers as complete units. Install in prepared cutouts in doors.
 - 3. Weld stationary blades to frames. Screw louvers into door openings.

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 3 mm (1/8 inch) clearance at the jambs, heads, and meeting stiles, and a 19 mm (3/4 inch) clearance at bottom, except as otherwise specified.
 - 2. Maximum clearance at bottom of sound rated doors, light-proofed doors, doors to operating rooms, and doors designated to be fitted with mechanical seal: 10 mm (3/8 inch).
- C. Provide cutouts for special details required and specified.

- D. Rout doors for hardware using templates and location heights specified in Section, 08 71 00 DOOR HARDWARE.
- E. Fit doors to frame, bevel lock edge of doors 3 mm (1/8 inch) for each 50 mm (two inches) of door thickness, undercut where shown.
- F. Immediately after fitting and cutting of doors for hardware, seal cut edges of doors with two coats of water resistant sealer.
- G. Finish surfaces, including both faces, top and bottom and edges of the doors smooth to touch.

3.2 INSTALLATION OF DOORS APPLICATION OF HARDWARE

Install doors and hardware as specified in Section, INSTALLATION OF DOORS AND HARDWARE.

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 Resident Engineer.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 08 42 29

SLIDING AUTOMATIC ENTRANCES

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section includes the following types of automatic entrance doors:

1. Interior single sliding automatic entrance doors with sidelites.

B. Related Sections:

1. Division 7 Sections for caulking to the extent not specified in this section.
2. Division 26 and 28 Sections for electrical connections including conduit and wiring for automatic entrance door operators and access control devices.

1.2 REFERENCES

A. References: Refer to the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 101 - Life Safety Code.

B. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).

1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
2. ANSI Z97.1 Standards for Safety Glazing Material Used in Buildings.

C. Underwriters Laboratories (UL).

1. UL 325 Standard for Door, Drapery, Gate, Louver and window Operators and Systems.

D. American Association of Automatic Door Manufacturers (AAADM).

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

1. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
2. ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.

G. American Architectural Manufacturers Association (AAMA).

1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.

H. National Association of Architectural Metal Manufacturers (NAAMM).

1. Metal Finishes Manual for Architectural Metal Products.

I. International Code Council (ICC).

1. IBC: International Building Code Building Code.

1.4 DEFINITIONS

A. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to open the door.

1. Knowing act: Consciously initiating the opening of a power operated door using acceptable methods including wall mounted switches such as push plates and controlled access devices such as keypads, card readers and key switches.

B. Safety Device: A device that detects the presence of an object or person within a zone where injury could occur and provides a signal to stop the movement of the door.

C. AAADM: American Association of Automatic Door Manufacturers.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide doors that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.

B. Compliance:

1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
2. UL 325 listed.

C. Automatic door equipment accommodates medium to heavy pedestrian traffic.

D. Automatic Door equipment accommodates up to the following weights for active leaf doors:

1. Single doors: 300 lbs (136 kg) per active breakout leaf.

E. Operating Temperature Range: -31° F to 122° F (-35° C to 50° C)

F. Entrapment Force Requirements:

1. Power Operated Sliding Doors: Not more than 30 lbf (133 N) required to prevent stopped door from closing.
2. Sliding doors provided with a breakaway device shall require no more than 50 lbf (222N) applied 1 inch (25 mm) from the leading edge of the lock stile for the breakout panel to open.

1.6 SUBMITTALS

A. Comply with Division 01 - Submittal Procedures.

B. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, fabrication, operational descriptions and finishes.

C. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections and details, indicating dimensions, materials, and fabrication of doors, frames, sidelites, operator, motion /presence sensor control device, anchors, hardware, finish, options and accessories.

D. Samples: Submit manufacturer's samples of aluminum finish.

- E. Manufacturers Field Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA A156.10 after completion of installation.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door opening installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include spare parts list.
- H. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.7 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 10 years of documented experience in manufacturing of doors and equipment of similar to that indicated for this Project and that have a proven record of successful in-service performance.
 - 1. A manufacturer with company certificate issued by AAADM.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing and maintenance of units similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Certified Inspector Qualifications: Certified by AAADM.
- D. Source Limitations for Automatic Entrances: Obtain each type of door, frame, operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated.

- E. Power-Operated Pedestrian Door Standard: ANSI/BHMA A156.10 (current version).
- F. Emergency Exit door requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings to receive automatic entrances by field measurements before fabrication and indicate on shop drawings.

1.9 COORDINATION

- A. Coordinate sizes and locations of recesses in concrete floors for recessed tracks and thresholds if applicable. Concrete, reinforcement and formwork are specified in Division 03.
- B. Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies and access control system as applicable.

1.10 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Automatic Entrance Doors shall be free of defects in material and workmanship for a period of One (1) year from the date of substantial completion.
- C. During the warranty period a factory-trained technician shall perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.

- D. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal business hours.
- E. Manufacturer shall have in place a dispatch procedure that shall be available 24 hours a Day, 7 Days a week for emergency call back service.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Manufacturer: ASSA ABLOY Entrance Systems OR APPROVED EQUAL offering a standard product matching the salient characteristics described herein.

2.2 SLIDING AUTOMATIC ENTRANCES

- A. Model: Besam SL500 sliding automatic doors. (Basis of Design):
 - 1. Aluminum doors and frames with sidelites and active door leaves.
 - 2. Overhead concealed, electro-mechanical, microprocessor controlled, sliding door operator.
 - 3. Operator housing, guide system and door carriers.
- B. Sliding Automatic Entrance Doors Configuration:
 - 1. Single slide, surface mounted with sidelite, door system.
 - a. Configuration: Single slide door unit and one sidelite unit.
 - b. Traffic Pattern: Two-way.
 - c. Emergency Breakaway Capability: Sliding leaf and sidelite unit.
 - d. Mounting: Surface mounted header installed on face of wall.

2.3 ALUMINUM DOORS AND FRAMES

- A. Doors and Frames: Extruded Aluminum, Alloy 6063-T5.
 - 1. Door panels shall have a minimum .125" structural wall thickness including adjoining horizontal members and perimeter frames where applicable.

2. Door Construction shall be by means of an integrated corner block with 3/8 inch all-thread through bolt from each stile.
3. Glass stops shall be .062" wall thickness and shall provide security function as a standard by means of a fixed non-removable exterior section with glazing to be performed from the interior only. Glazing stops that allow for glass removal from the exterior shall not be deemed as equivalent.
4. The sliding door system shall include two interlocks securing the leading stile of the sidelite and the butt stile of the sliding door panel together.
5. Vertical Stiles shall be medium stile 4 inch (102 mm).
6. Bottom Rails shall be standard 4 inch (102 mm)
7. Weather-stripping shall be slide-in type, replaceable pile mohair seals retained by the aluminum extrusions. The following types of weather-stripping are required: complementing weather-stripping on the joining vertical stiles of the sidelite and sliding door panels, complementing weather-stripping on the lead edge of the lock stiles of bi-parting doors, single pile weather-stripping between the carrier and the header, single pile weather-stripping on the lead edge stile of single slide door panels, dual pile weather-stripping on the pivot stile of breakout sidelite panels, and dual pile weather-stripping on the butt stile of fixed sidelite panels. Bottom rails shall be provided with an adjustable nylon sweep.

B. Glass: Glazing shall comply with ANSI Z97.1, thickness as indicated.

1. Glazing Active Door Panels: 1/4" (6 mm) tempered, unless otherwise specified.

2. Glazing Breakout Sidelite Panels: 1/4" (6 mm) tempered, unless otherwise specified.

C. Door Carriers: Manufacturer's standard carrier assembly that allows vertical adjustment.

1. Carriage Assembly: Carriage bar with two wheel assemblies. Each assembly shall have tandem roller wheels.
2. Roller Wheels: Two heavy duty Delrin roller wheels per wheel assembly, for a total of four (4) roller wheels, 1-7/16 inch (36.51 mm) diameter, per active door leaf for operation over a replaceable aluminum track. Single journal with sealed oil impregnated bearings.
3. Two (2) heavy duty self-aligning anti-risers per leaf.

D. Framing Members: Provide automatic entrances as complete assemblies. Manufacturer's standard extruded aluminum framing reinforced as required to support loads.

1. Vertical jambs shall be 1-3/4 inches (44 mm) by 6 inches (152 mm).

E. Header: Manufacturer's standard one-piece extruded aluminum header with a replaceable aluminum track extending full width of entrance unit. Header to conceal door operators, carrier assemblies, and roller track; complete with hinged access panel for service of door operator, and controls.

1. Span: Maximum 16'-0" (4.9 m) without intermediate supports when using 1/4-inch glass.
 - a. Capacity: Capable of supporting active breakout leafs up to maximum of 300 lb (136 kg) per leaf when header is supported per manufacturer's recommendations.
2. Size: 6 inches (152 mm) wide by 7 inches (177.8 mm) high.
 - a. Header height including the sensor plate cap which spans the clear door opening width is 8-1/2 inches (215.9 mm) high.

3. Hinge Point: Continuous hinge at top of header allows for complete access to operator and internal electronic and mechanical assemblies.

4. Design: Manufacturer's standard closed header.

F. Hardware: Provide manufacturer's standard hardware as required for operation indicated.

1. Breakaway arms and bottom pivot assemblies shall be supplied by the manufacturer and shall be adjustable to comply with applicable codes.

2. Locking hardware shall be provided as indicated.

a. Mortise type hookbolt latch. (Single slide sliding door system).

1) Interior Side: Keyed cylinder. Lock indicators shall be provided if required by code.

2) Exterior Side: Keyed cylinder.

3. Keyed cylinders shall be provided as indicated.

a. Keyed cylinder specified in Division 8 Section "Door Hardware".

G. Guide Track/Threshold: Manufacturer's threshold as indicated.

1. Aluminum guide track, surface mounted adjacent to the wall construction, shall not extend past the jamb into the door opening.

2.4 SLIDING DOOR OPERATOR

A. Door Operator and Controller:

1. Electro-mechanical controlled unit utilizing a high-efficiency, energy efficient, DC motor requiring a maximum of 3 amp current draw, allowing 5 operators on one 20 amp circuit. The supplied system shall have the capability to operate at full performance well beyond a brown out and high line voltage conditions (85V - 265V) sensing changes and adjusting automatically. The operator shall allow an adjustable hold open time delay of 0 to 60 seconds

and have internal software to incorporate a self-diagnostic system.

B. Microprocessor Control Box:

1. Modular control unit to allow for changing technology. Factory-adjusted configuration with opening and closing speeds set to comply with ANSI/BHMA A156.10 requirements and electronic dampening to reduce wear on drive train. Should the drive train operations deviate from design criteria ranges, Watchdog Control Circuit Monitoring will assume command of the system and shut down the automatic function allowing a secondary supervisory circuit to perform as a backup. Control unit shall allow the following functions:
 - a. Diagnostics with the ability to produce application data.
2. Mode Selector Control:
 - a. Multi-position rotary knob switch mode selector switch to be interior jamb mounted and shall allow selection of the indicated functions to be engaged when switch is turned to the appropriate setting.]
 - b. Mode selector control to allow the following functions:
 - 1) "Off"
 - 2) "Exit Only" one way traffic with automatic operation from the interior.
 - 3) "Two Way Traffic" allowing automatic operation from exterior and interior.
 - 4) "Partial Opening" energy saving door position allows door to automatically adjust opening width based on amount of usage, that is, full open during high use and partial open during low use. The control for this setting is programmable allowing adjustment to both the usage setting and the width.
 - 5) "Hold Open" doors activated and held in the full open position.

2.5 ACTIVATION AND SAFETY CONTROL DEVICES

- A. General: Provide the types of activation and safety devices specified in accordance with ANSI/BHMA standards, for the condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.
- B. Combination Activation Motion Sensor/Safety Presence Sensor:
 - 1. Shall be a sliding door sensor utilizing focused active infrared technology to detect both motion and presence, combined in a single housing surface mounted on each side of the header.
 - a. Presence sensor shall remain active at all times.
 - b. The sensor shall communicate with the automatic door operator through a self-monitoring connection that allows the door to go into a fail safe mode preventing the door from closing in the event of a sensor failure.
 - 2. Motion/presence detecting sensors to be field installed and adjusted.

2.6 ELECTRICAL

- A. High-Efficiency DC Motor: Maximum of 3 amp current draw, allowing 5 operators to run on one 20 Amp circuit.
- B. Power: Self-detecting line voltage capable control. 120 VAC through 240 VAC, 50/60 Hz, 3 amp minimum incoming power with solid earth ground connection for each door system.
- C. Key Impulse Input: Input for card readers or remote activation with independent adjustable hold open delay.
- D. Wiring: Separate internal channel raceway free from moving parts.
- E. Brown out / high voltage capability: System has capability to operate at full performance well beyond brown out and high voltage line conditions (85 V - 265 V) sensing changes and adjusting automatically.
- F. Convenience Battery: Shall be concealed in header and capable of full operation with blackout conditions, including sensor capabilities for minimum of 100 cycles.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.8 ALUMINUM FINISHES

- A. Anodized Finish:
 - 1. AAMA 611, Clear, AA- M12C22A41, Class I, 0.018 mm.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical source power to verify actual locations of wiring connections.
- C. Proceed only after such discrepancies or conflicts have been resolved.

3.2 INSTALLATION

- A. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
- B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, carrier assemblies, tracks, operating brackets and guides level and true to location with anchorage for permanent support.
- C. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.

- D. Glazing: Glaze sliding automatic entrance door panels in accordance with the Glass Association of North America (GANA) Glazing Manual, published recommendations of glass product manufacturer, and published instructions of automatic entrance system manufacturer.
- E. Sealants: Comply with requirements specified in division 7 Section "Joint Sealants" to provide weather tight installation.
 - 1. Set thresholds, bottom guide and track systems and framing members in full bed of sealants.
 - 2. Seal perimeter of framing members with sealant.
- F. Signage: Apply signage on both sides of each door and sidelite as required by ANSI/BHMA A156.10 and manufacturers installation instructions.

3.3 FIELD QUALITY CONTROL

- A. Manufacturers Field Services:
 - 1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.
 - 2. Before placing doors into operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA A156.10. Certified technician shall be approved by manufacturer.

3.4 ADJUSTING

- A. Adjust door operators, controls and hardware for smooth and safe operation and for weather tight closure. Adjust doors in compliance with ANSI/BHMA A156.10.

3.5 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door installation.
- B. Clean glass and metal surfaces promptly after installation. Remove excess sealants, compounds, dirt and other substances. Repair damages finish to match original finish.

3.6 DEMONSTRATION

- A. Engage a factory-authorized representative to train Owner's maintenance personnel to adjust, operate, and maintain safe operation of the door.

- - - E N D - - -

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 to match existing system.
- B. VA has specific preference in the type of locks to ensure consistency with the existing lock system. Coordinate with VA Project Manager for requirements.
- C. All door hardware shall be ADA compliant.

1.2 RELATED WORK

- A. Application of Hardware: Section 08 14 00, WOOD DOORS; Section 08 11 13, HOLLOW METAL DOOR FRAMES.
- B. Painting: Section 09 91 00, PAINTING.
- C. Lead Lined Doors & frames: Section 13 49 00, RADIATION PROTECTION
- D. Low Energy Power Assist Door Operators: Section 08 71 13.11 LOW ENERGY POWER ASSIST DOOR OPERATORS

1.3 GENERAL

- A. All hardware shall comply with UFAS, (Uniform Federal Accessible Standards) unless specified otherwise.
- B. 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.
- C. Deadlocks specified for psychiatric area doors are not required to have "UL" label.
- 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, if possible, 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 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Hardware Schedule: Prepare and submit hardware schedule in the following form:

Hardware Item	Quantity	Size	Reference Publication Type No.	Finish	Mfr. Name and Catalog No.	Key Control Symbols	UL Mark (if fire rated and listed)	ANSI/BHMA Finish Designation

- C. Samples and Manufacturers' Literature:
1. Samples: All hardware items (proposed for the project) that have not been previously approved by Builders Hardware Manufacturers Association shall be submitted for approval. Tag and mark all items with manufacturer's name, catalog number and project number.
 2. Samples are not required for hardware listed in the specifications by manufacturer's catalog number, if the contractor proposes to use the manufacturer's product specified.
- D. Certificate of Compliance and Test Reports: Submit certificates that hardware conforms to the requirements specified herein. Certificates shall be accompanied by copies of reports as referenced. The testing shall have been conducted either in the manufacturer's plant and certified by an independent testing laboratory or conducted in an independent laboratory, within four years of submittal of reports for approval.

1.5 DELIVERY AND MARKING

Deliver items of hardware to job site in their original containers, complete with necessary appurtenances including screws, keys, and instructions. Tag one of each different item of hardware and deliver to Resident Engineer for reference purposes. Tag shall identify items by Project Specification number and manufacturer's catalog number. These

items shall remain on file in Resident Engineer's office until all other similar items have been installed in project, at which time the Resident Engineer will deliver items on file to Contractor for installation in predetermined locations on the project.

1.6 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 "HW" followed by a number. Each number designates a set of hardware items applicable to a door type.
- B. Manufacturers' Catalog Number References: Where manufacturers' products are specified herein, products of other manufacturers which are considered equivalent to those specified may be used. Manufacturers whose products are specified are identified by abbreviations as follows:

Adams-Rite	Adams Rite Mfg. Co.	Glendale, CA
Glynn Johnson	Glynn Johnson Co.	Chicago, IL
LCN	LCN Closers	Princeton, IL
Firemark	Rixon-Firemark Co.	Chicago, IL
Hager	Hager Hinge Company	Saint Louis, MO
Stanley	The Stanley Works	New Britain, CT
Trimco	Triangle Brass Mfg. Co.	Los Angeles, CA
Unican	Simplex Security Systems	Collinsville, CT
Von Duprin	Von Duprin Hardware Co.	Indianapolis, IN
Zero	Zero Weather Stripping Co.	New York, NY

- C. Keying: Keying information shall be furnished at a later date by the Resident Engineer.

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. 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

C. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):

- A156.1-00.....Butts and Hinges
- A156.2-03.....Bored and Pre-assembled Locks and Latches
- A156.3-01.....Exit Devices
- A156.4-00.....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
- A156.13-05.....Mortise Locks and Latches Series 1000
- A156.15-06.....Release Devices-Closer Holder, Electromagnetic
and Electromechanical
- A156.16-02.....American National Standard for Auxiliary
Hardware
- A156.18-06.....Materials and Finishes
- A156.21-06.....Thresholds
- A156.22-03.....Door Gasketing and Edge Seal Systems
- A156.23-04.....Electromagnetic Locks
- A156.24-03.....Delayed Egress Locking Systems
- A156.26-06.....Continuous Hinges
- A156.31-01American National Standard for Electric Strikes
and Frame Mounted Actuators
- A250.8-03.....Standard Steel Doors and Frames

D. National Fire Protection Association (NFPA):

- 80-07.....Fire Doors and Fire Windows
- 101-09.....Life Safety Code

E. Underwriters Laboratories, Inc. (UL):

Building Materials Directory (2007)

PART 2 - PRODUCTS

2.1 BUTT HINGES

A. ANSI A156.1. The following types of butt hinges shall be used for the types of doors listed, except where otherwise specified:

1. Interior Doors: Type 8112 for doors 900 mm (3 feet) wide or less and Type A8111 for doors over 900 mm (3 feet) wide.
2. Any door installed in structural steel frames: Type A2412, A8412, A2411 or A8411 as applicable, except where otherwise specified. Such

hinges shall be of same quality and weight as other hinges listed above for applicable door sizes.

3. Labeled Wood Fire Doors: Type 8411 or Type 8412; these hinges shall be thru bolted to door with hex nuts and bolts.

B. See Articles "MISCELLANEOUS HARDWARE" and "HARDWARE SETS" for pivots and hinges other than butts specified above and continuous hinges specified below.

2.3 DOOR CLOSING DEVICES

Closing devices shall be products of one manufacturer for each type specified.

2.4 OVERHEAD CLOSERS

- A. Conform to ANSI A156.4, Grade 1.
- B. Closers shall conform to the following:
 1. The closer shall have 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: Size closers in accordance with manufacturer's recommendations or provide multi-size closers, sizes 1 through 6.
 4. Material of closer shall be forged or cast aluminum.
 5. Arm and brackets for closers shall be steel, malleable iron or high strength ductile cast iron.
 6. Closers shall have full size cover.
 7. Closers shall have adjustable hydraulic back-check and separate valves for closing and latching speed.

2.7 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. Substitute floor stops Type L02141 or L02161 as appropriate, when wall bumpers would not provide an effective door stop.
- E. Where drywall partitions occur, use floor stops, Type L02141 or L02161.

- F. Provide stop Type L02011 or L02181, as applicable for exterior doors.
- 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 two doors would interfere with each other in swinging.

2.8 OVERHEAD DOOR HOLDERS

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.

2.9 FLOOR DOOR HOLDERS

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

2.10 LOCKS AND LATCHES

- A. Conform to ANSI A156.2. Locks and latches for doors 45 mm (1-3/4 inch) thick or over shall have beveled fronts. Lock cylinders shall have not less than six 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 19 mm (3/4 inch) throw. Provide temporary keying device or construction core of allow opening and closing during construction and prior to the installation of final cores.
- B. In addition to above requirements, locks and latches shall comply with following requirements:
 - 1. Mortise Lock and Latch Sets: Conform to ANSI/BHMA A156.13. Mortise locksets shall be series 1000, minimum Grade 2. All locksets and latchsets, except on designated doors in Psychiatric (Mental Health) areas, shall have lever handles similar to Falcon S-lever Design. Lever handle shall be fabricated from wrought stainless steel. No substitute lever design or material shall be accepted. All locks and

latchsets shall be furnished with curved lip strike and wrought box. Lock function F02 shall be furnished with key plates similar to Russwin's No. A70. All lock cases installed on lead lined doors shall be lead lined before applying final hardware finish. Furnish armored fronts for all mortise locks.

2. Cylindrical Lock and Latch Sets: levers shall meet ADA (Americans with Disabilities Act) requirements. Cylindrical locksets shall be series 4000 Grade I. Where two 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. Locks on designated doors in Psychiatric (Mental Health) areas shall be paddle type with arrow projection covers and be UL Listed. Provide these locks with paddle in the down position on both sides of the door. Locks shall be fabricated of wrought stainless steel.

C. Manufacturers:

1. MBS Locks with Falcon Cores, no substitution.

2.11 PUSH-BUTTON COMBINATION LOCKS

- A. ANSI/BHMA A156.5, Grade 1. Mechanical or electrically operated as indicated.
- B. Construction: Heavy duty cylindrical lock housing conforming to ANSI/BHMA A156.2, Grade 1. Lever handles and operating components in compliance with the UFAS and the ADA Accessibility Guidelines.
- C. Special Features: Key override to permit a master keyed security system and a key activated passage feature to allow access without using the entry code.
- D. Manufacturers:
 1. Alarm Lock.
 2. Code Locks, LLC
 3. Locknetics; an Ingersoll Rand company.
 4. Kaba Ilco.
 5. MBS Locks with Falcon cores.

2.15 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	1 key

- B. Psychiatric keys shall be cut so that first two bittings closest to the key shoulder are shallow to provide greater strength at point of greatest torque.

2.16 KEY CABINET

- A. Use existing key cabinet to hold new keys. Label all new keying to match existing system as directed VA Project Manager.

2.17 ARMOR PLATES, COMBINATION KICK-MOP PLATES AND DOOR EDGING

- A. Conform to ANSI Standard A156.6.
- B. Provide protective plates and door edging as specified below:
1. Kick-mop plates and armor plates metal, Type J100 series, color as required.
 2. Provide kick-mop plates for both sides of each new door, except where noted as not required. Kick-mop plates shall be 200 mm (8 inches) high. On push side of doors where jamb stop extends to floor, make combination kick-mop plates 38 mm (1-1/2 inches) less than width of door, except pairs of metal doors which shall have plates 25 mm (1 inch) less than width of each door. Extend all other combination kick-mop plates to within 6 mm (1/4 inch) of each edge of doors. Kick mop plates shall butt astragals. For jamb stop requirements, see specification sections pertaining to door frames.
 3. Kick-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) Storage side of doors to or from storage spaces; and

- e) Both sides of aluminum entrance doors.
- 4. Armor plates for doors are listed under Article "Hardware Sets".
Armor plates shall be 875 mm (35 inches) high and 38 mm (1-1/2 inches) less than width of doors, except on pairs of metal doors. Plates on pairs of metal doors shall be 25 mm (1 inch) less than width of each door. Where top of intermediate rail of door is less than 875 mm (35 inches) from door bottom, extend armor plates to within 13 mm (1/2 inch) of top rail. On doors equipped with panic devices, extend armor plates to within 13 mm (1/2 inch) of panic bolt cross bar.
- 5. Where louver or grille occurs in lower portion of doors, substitute stretcher plate and kick-mop plate in place of armor plate. Size of stretcher plate and kick-mop plate shall be 200 mm (8 inches) high.

2.18 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 lever handles similar to locksets, unless otherwise specified.
- B. Exit devices for fire doors shall comply with Underwriters Laboratories, Inc., requirements for Fire Exit Hardware. Submit proof of compliance.

2.19 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. Face plates for cylindrical strikes shall be rectangular and not less than 25 mm by 63 mm (1 inch by 2-1/2 inches).
- C. Friction-fit cylindrical dustproof strikes with circular face plate may be used only where metal thresholds occur.

2.21 DOOR PULLS

Conform to ANSI A156.6. Pull plate 90 mm by 350 mm (3-1/2 inches by 14 inches), unless otherwise specified. Cut plates of door pulls for cylinders, or turn pieces where required.

2.22 PUSH PLATES

Conform to ANSI A156.6. Plastic, Type J302, 200 mm (8 inches) wide by 350 mm (14 inches) high. Provide plastic Type J300 plates 100 mm (4

inches wide by 350 mm (14 inches) high) where push plates are specified for doors with stiles less than 200 mm (8 inches) wide. Color shall be as specified for kick-mop plates. Cut plates for cylinders, and turn pieces where required. When wood grain plastic plates are specified, grain in plates shall run in same direction as grain of face veneer of wood doors.

2.23 COMBINATION PUSH AND PULL PLATES

Conform to ANSI 156.6. Type J303, stainless steel 3 mm (1/8 inch) thick, 80 mm (3-1/3 inches) wide by 800 mm (32 inches) high), top and bottom edges shall be rounded. Secure plates to wood doors with 38 mm (1-1/2 inch) long No. 12 wood screws. Cut plates for turn pieces, and cylinders where required. Pull shall be mounted down.

2.24 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 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.

2.25 MAGNETIC HOLD OPENS

- A. Provide magnetic hold opens and all required components to be VA Tampa Facility standard or as directed by VA Project Manager.

2.26 ACCESS CONTROL DEVICES, CARD READERS, & COMPONENTS

- A. Provide card readers to be equal to DigiReader NexSentry by Westinghouse Security Electronics, Inc. to be compatible with the Honeywell NexKey Access Card. Provide all required components for fully operable condition to tie into existing Facility's access control system.

2.27 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. Wicket door (in roll-up door assemblies).
3. Slide-up doors.
4. Swing-up doors.
5. Fire-rated access doors-Engineer's key set.
6. Doors from corridor to electromagnetic shielded room.

C. Mutes: Conform to ANSI A156.16. Provide door mutes or door silencers Type L03011, of light gray color, on each steel door frame, except 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.

2.28 THERMOSTATIC TEMPERATURE CONTROL VALVE CABINETS

- A. Where lock is shown, equip each cabinet door (metal) with lock Type E06213, conforming to ANSI A156.1. Key locks in Key Sets approved by Contracting Officer. 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 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.
 3. Pivots: Match door trim.
 4. Door Closers: Factory applied paint finish. Dull or Satin Aluminum.
 5. Thresholds: Mill finish aluminum.
 6. Cover plates for floor hinges and pivots: 630.

7. Other primed steel hardware: 652.
- D. Hardware Finishes for Existing Buildings: U.S. Standard finishes shall match finishes of hardware in (similar) existing spaces except where otherwise specified.
- E. Color of Plastic Items: Where colors other than chocolate brown or black are specified, color of core material may be different than color of face.

2.30 BASE METALS

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 Resident Engineer for approval.

3.2 INSTALLATION

- A. Closer devices, including those with hold-open features, shall be equipped and mounted to provide maximum door opening permitted by building construction or equipment. Closers shall be mounted regular arm. 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. Substitute parallel arm or top jamb mounting for regular arm mounting where the following conditions occur:
1. Where door swing, in full open position, would be limited to less than 90 degrees due to partition construction and closer location.
 2. Where door to room opens outward into corridor, except security bedroom, bathroom and anteroom doors which shall have closer installed parallel arm on exterior side of doors.
 3. On doors equipped with roller latch.

C. Hinge Size Requirements:

Door Thickness	Door Width	Hinge Height
45 mm (1-3/4 inch)	900 mm (3 feet) and less	113 mm (4-1/2 inches)
45 mm (1-3/4 inch)	Over 900 mm (3 feet) but not more than 1200 mm (4 feet)	125 mm (5 inches)

D. Hinge leaves shall be sufficiently wide to allow doors to swing clear of door frame trim.

E. 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 Resident Engineer. 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.

F. Hinges Required Per Door:

Doors 1500 mm (5 ft) or less in height	2 butts
Doors over 1500 mm (5 ft) high and not over 2280 mm (7 ft 6 in) high	3 butts
Doors over 2280 mm (7 feet 6 inches) high	4 butts
Dutch type doors	4 butts
Doors with spring hinges 1370 mm (4 feet 6 inches) high or less	2 butts
Doors with spring hinges over 1370 mm (4 feet 6 inches)	3 butts

G. 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.

H. After locks have been installed; show in presence of Resident Engineer 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 bidding list. Also a copy of the invoice shall be sent to the Resident Engineer 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 HARDWARE SETS

Set 1: Interior Door, w/closer, Privacy Lockset

Each pair to have:

- 1 ½ pr. Butts
- 1 Lockset ANSI F19
- 1 Closer
- 1 Stop
- 3 Silencers
- 1 Mop Plates (Pull Side)
- 1 Kick Plates (Push Side)

Set 2: Interior Door, w/closer, Office Lockset

Each pair to have:

- 1 ½ pr. 180 Deg Butts
- 1 Lockset ANSI 04
- 1 180 Deg Closer
- 1 Stop
- 1 Kick Down Door Holder
- 3 Silencers
- 1 Mop Plates (Pull Side)
- 1 Kick Plates (Push Side)

Set 2: Interior Pair doors, Fire Rated, w/Lead shielding Assembly & Entrance Lockset

Each pair to have:

- 3 pr Electrified Butt
- 2 Electrified lockset
- 1 Automatic Door Operator to operate both leaves at same time
- 1 Coordinator if required
- 2 Floor stops
- 2 Door Bottoms
- 1 Set Smoke Seals
- 2 Silencers
- 4 Door Protection Plates (Both Sides)
- 1 Astragal

Provide all components as required for fully shielded assembly.
Provide push button & all connections in Control Room to be able to disable the Corridor push button actuators with all components & programming as required for fully operational & Code compliant condition.

Set 3: Interior single door, Storage Lockset, w/closer

Each door to have:

- 2 pr. Butts
- 1 Lockset (Biomed specific keying)
- 1 Closer
- 1 Stop
- 1 Mop Plate (Pull Side)
- 3 Silencers

Set 4: Interior pair doors, Passage set, w/ magnetic hold backs & closers

Each pair to have:

- 3 pr Butts
 - 2 Lever sets
 - 2 Closers
 - 2 Exit Devices (Concealed Rod)
 - 2 Set Magnetic Hold Opens
 - 2 Silencers
 - 2 Mop Plates (Pull Side)
 - 2 Door Protection Plates (Push Side)
- Magnetic Hold Opens shall tied into building fire alarm system.

- - - E N D - - -

SECTION 09 22 16
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies steel studs wall systems, ceiling or soffit suspended or furred framing, wall furring, fasteners, and accessories for the screw attachment of gypsum board, plaster bases or other building boards.

Provide acoustical insulation in all new walls and as indicated in drawings.

1.2 RELATED WORK

- A. Ceiling suspension systems for acoustical tile or panels and lay in gypsum board panels: Section 09 51 00, ACOUSTICAL CEILINGS; Section 09 29 00, GYPSUM BOARD.
- B. Section 13 49 00, RADIATION PROTECTION

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

In accordance with the requirements of ASTM C754.

1.6 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society For Testing And Materials (ASTM)
- | | |
|-----------------------|--|
| A123-08..... | Zinc (Hot-dip Galvanized) Coatings on Iron and Steel Products |
| A653/A653M-08..... | Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process |
| A641/A641M-03..... | Zinc-Coated (Galvanized) Carbon Steel Wire |
| C11-08..... | Terminology Relating to Gypsum and Related Building Materials and Systems |
| C635/C635M-07..... | Manufacture, Performance, and Testing of Metal Suspension System for Acoustical Tile and Lay-in Panel Ceilings |
| C636/C636M-08..... | Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels |
| C645-07..... | Non-Structural Steel Framing Members |
| C754-07..... | Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products |
| C841-03 (2008)e1..... | Installation of Interior Lathing and Furring |
| C954-07..... | 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

C1002-07.....Steel Self-Piercing Tapping Screws for the
Application of Gypsum Panel Products or Metal
Plaster Bases to Wood Studs or Steel Studs

E580/E580M-08.....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

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 and shown.
 - 1. Use ASTM A525 steel, 0.9 mm (0.0359-inch) thick bare metal (20 gauge).
 - 2. Runners same thickness as studs.
- B. Provide not less than two cutouts in web of each stud, approximately 300 mm (12 inches) from each end, and intermediate cutouts on approximately 600 mm (24-inch) centers.
- C. Doubled studs for openings and studs for supporting concrete backer-board.
- D. Studs 3600 mm (12 feet) or less in length shall be in one piece.
- 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 0.45 mm (0.0179-inch) thick bare metal.

2. Semi-hat shape, only one 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. "Z" Furring Channels:

1. Not less than 0.45 mm (0.0179-inch)-thick bare metal, with 32 mm (1-1/4 inch) and 19 mm (3/4-inch) flanges.
2. Web furring depth to suit thickness of insulation with slotted perforations.

D. 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 0.84 mm (0.033-inch) thick. Use ASTM C954 steel drill screws of size and type recommended by the manufacturer of the material being fastened.
- D. Clips: ASTM C841 (paragraph 6.11), manufacturer's standard items. Clips used in lieu of tie wire shall have holding power equivalent to that provided by the tie wire for the specific application.
- E. Concrete ceiling hanger inserts (anchorage for hanger wire and hanger straps): Steel, zinc-coated (galvanized), manufacturers standard items, designed to support twice the hanger loads imposed and the type of hanger used.
- F. Tie Wire and Hanger Wire:
 1. ASTM A641, soft temper, Class 1 coating.
 2. Gage (diameter) as specified in ASTM C754 or ASTM C841.
- G. Attachments for Wall Furring:
 1. Manufacturers standard items fabricated from zinc-coated (galvanized) steel sheet.
 2. For concrete or masonry walls: Metal slots with adjustable inserts or adjustable wall furring brackets. Spacers may be fabricated from 1 mm (0.0396-inch) thick galvanized steel with corrugated edges.

- H. Power Actuated Fasteners: Type and size as recommended by the manufacturer of the material being fastened.

2.5 SUSPENDED CEILING SYSTEM FOR GYPSUM BOARD (OPTION)

- A. Conform to ASTM C635, heavy duty, with not less than 35 mm (1-3/8 inch) wide knurled capped flange face designed for screw attachment of gypsum board.
- B. Wall track channel with 35 mm (1-3/8 inch) wide flange.

2.6 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.

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 studs in accordance with ASTM C754, except as otherwise shown or specified.
- B. Space studs not more than 610 mm (24 inches) on center.
- C. Cut studs 6 mm to 9 mm (1/4 to 3/8-inch) less than floor to underside of structure overhead when extended to underside of structure overhead.
- D. Where studs are shown to terminate above suspended ceilings, provide bracing as shown or extend studs to underside of structure overhead.
- E. Extend studs to underside of structure overhead for fire, rated partitions, smoke partitions, shafts, and sound rated partitions and insulated exterior wall furring.
- F. At existing plaster ceilings and where shown, studs may terminate at ceiling as shown.

G. Openings:

1. Frame jambs of openings in stud partitions and furring with two studs placed back to back or as shown.
2. Fasten back to back studs together with 9 mm (3/8-inch) long Type S pan head screws at not less than 600 mm (two feet) on center, staggered along webs.
3. Studs fastened flange to flange shall have splice plates on both sides approximately 50 X 75 mm (2 by 3 inches) screwed to each stud with two screws in each stud. Locate splice plates at 600 mm (24 inches) on center between runner tracks.

H. Fastening Studs:

1. Fasten studs located adjacent to partition intersections, corners and studs at jambs of openings to flange of runner tracks with two screws through each end of each stud and flange of runner.
2. Do not fasten studs to top runner track when studs extend to underside of structure overhead.

I. Chase Wall Partitions:

1. Locate cross braces for chase wall partitions to permit the installation of pipes, conduits, carriers and similar items.
2. Use studs or runners as cross bracing not less than 63 mm (2-1/2 inches wide).

J. Form building seismic or expansion joints with double studs back to back spaced 75 mm (three inches) apart plus the width of the seismic or expansion joint.

K. Form control joint, with double studs spaced 13 mm (1/2-inch) apart.

3.3 INSTALLING WALL FURRING FOR FINISH APPLIED TO ONE SIDE ONLY

A. In accordance with ASTM C754, or ASTM C841 except as otherwise specified or shown.

B. Wall furring-Stud System:

1. Framed with 63 mm (2-1/2 inch) or narrower studs, 600 mm (24 inches) on center.
2. Brace as specified in ASTM C754 for Wall Furring-Stud System or brace with sections or runners or studs placed horizontally at not less than three foot vertical intervals on side without finish.

3. Securely fasten braces to each stud with two Type S pan head screws at each bearing.
- C. Direct attachment to masonry or concrete; rigid channels or "Z" channels:
 1. Install rigid (hat section) furring channels at 600 mm (24 inches) on center, horizontally or vertically.
 2. Install "Z" furring channels vertically spaced not more than 600 mm (24 inches) on center.
 3. At corners where rigid furring channels are positioned horizontally, provide mitered joints in furring channels.
 4. Ends of spliced furring channels shall be nested not less than 200 mm (8 inches).
 5. Fasten furring channels to walls with power-actuated drive pins or hardened steel concrete nails. Where channels are spliced, provide two fasteners in each flange.
 6. Locate furring channels at interior and exterior corners in accordance with wall finish material manufacturers printed erection instructions. Locate "Z" channels within 100 mm (4 inches) of corner.
- D. Installing Wall Furring-Bracket System: Space furring channels not more than 400 mm (16 inches) on center.

3.4 INSTALLING SUPPORTS REQUIRED BY OTHER TRADES

- A. Provide for attachment and support of electrical outlets, plumbing, laboratory or heating fixtures, recessed type plumbing fixture accessories, access panel frames, wall bumpers, wood seats, toilet stall partitions, dressing booth partitions, urinal screens, chalkboards, tackboards, wall-hung casework, handrail brackets, recessed fire extinguisher cabinets and other items like auto door buttons and auto door operators supported by stud construction.
- B. Provide additional studs where required. Install metal backing plates, or special metal shapes as required, securely fastened to metal studs.

3.5 INSTALLING FURRED AND SUSPENDED CEILINGS OR SOFFITS

- A. Install furred and suspended ceilings or soffits in accordance with ASTM C754 or ASTM C841 except as otherwise specified or shown for screw attached gypsum board ceilings and for plaster ceilings or soffits.
 1. Space framing at 400 mm (16-inch) centers for metal lath anchorage.

2. Space framing at 600 mm (24-inch) centers for gypsum board anchorage.
- B. New exposed concrete slabs:
1. Use metal inserts required for attachment and support of hangers or hanger wires with tied wire loops for embedding in concrete.
 2. Furnish for installation under Division 3, CONCRETE.
 3. Suspended ceilings under concrete rib construction shall have runner channels at right angles to ribs and be supported from ribs with hangers at ends and at 1200 mm (48-inch) maximum intervals along channels. Stagger hangers at alternate channels.
- C. Concrete slabs on steel decking composite construction:
1. Use pull down tabs when available.
 2. Use power activated fasteners when direct attachment to structural framing can not be accomplished.
- D. Where bar joists or beams are more than 1200 mm (48 inches) apart, provide intermediate hangers so that spacing between supports does not exceed 1200 mm (48 inches). Use clips, bolts, or wire ties for direct attachment to steel framing.
- E. Existing concrete construction exposed or concrete on steel decking:
1. Use power actuated fasteners either eye pin, threaded studs or drive pins for type of hanger attachment required.
 2. Install fasteners at approximate mid height of concrete beams or joists. Do not install in bottom of beams or joists.
- F. Steel decking without concrete topping:
1. Do not fasten to steel decking 0.76 mm (0.0299-inch) or thinner.
 2. Toggle bolt to decking 0.9 mm (0.0359-inch) or thicker only where anchorage to steel framing is not possible.
- G. Installing suspended ceiling system for gypsum board (ASTM C635 Option):
1. Install only for ceilings to receive screw attached gypsum board.
 2. Install in accordance with ASTM C636.
 - a. Install main runners spaced 1200 mm (48 inches) on center.
 - b. Install 1200 mm (four foot) tees not over 600 mm (24 inches) on center; locate for edge support of gypsum board.
 - c. Install wall track channel at perimeter.
- H. Installing Ceiling Bracing System:

1. Construct bracing of 38 mm (1-1/2 inch) channels for lengths up to 2400 mm (8 feet) and 50 mm (2 inch) channels for lengths over 2400 mm (8 feet) with ends bent to form surfaces for anchorage to carrying channels and over head construction. Lap channels not less than 600 mm (2 feet) at midpoint back to back. Screw or bolt lap together with two fasteners.
2. Install bracing at an approximate 45 degree angle to carrying channels and structure overhead; secure as specified to structure overhead with two fasteners and to carrying channels with two fasteners or wire ties.

3.7 TOLERANCES

- A. Fastening surface for application of subsequent materials shall not vary more than 3 mm (1/8-inch) from the layout line.
- B. Plumb and align vertical members within 3 mm (1/8-inch.)
- C. Level or align ceilings within 3 mm (1/8-inch.)

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 09 29 00
GYPSUM BOARD

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies installation and finishing of gypsum board.

1.2 RELATED WORK

- A. Installation of steel framing members for walls, partitions, furring, soffits, and ceilings: Section 09 22 16, NON-STRUCTURAL METAL FRAMING.
- B. Lay in gypsum board ceiling panels: Section 09 51 00, ACOUSTICAL CEILING.

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. Corner-bead and edge trim.
 - 2. Finishing materials.
 - 3. Laminating adhesive.
 - 4. Gypsum board, each type.
- C. Shop Drawings:
 - 1. Typical gypsum board installation, showing corner details, edge trim details and the like.
 - 2. Typical sound rated assembly, showing treatment at perimeter of partitions and penetrations at gypsum board.
 - 3. Typical shaft wall assembly.
 - 4. Typical fire rated assembly and column fireproofing, indicating details of construction same as that used in fire rating test.

D. Samples:

1. Cornerbead.
2. Edge trim.
3. Control joints.

E. Test Results:

1. Fire rating test, each fire rating required for each assembly.
2. Sound rating test.

1.5 DELIVERY, IDENTIFICATION, HANDLING AND STORAGE

In accordance with the requirements of ASTM C840.

1.6 ENVIRONMENTAL CONDITIONS

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):

C11-08c.....Terminology Relating to Gypsum and Related
Building Materials and Systems

C475/C475M-02 (2007)....Joint Compound and Joint Tape for Finishing
Gypsum Board

C840-08.....Application and Finishing of Gypsum Board

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/C1177M-08.....Glass Mat Gypsum Substrate for Use as Sheathing

C1396/C1396M-06a.....Gypsum Board

E84-08.....Surface Burning Characteristics of Building
Materials

E497-99.....Installing Sound Isolating Lightweight
Partitions

- 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, 16 mm (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. Coreboard for shaft walls 300, 400, 600 mm (12, 16, or 24 inches) wide by required lengths 25 mm (one inch) thick with paper faces treated to resist moisture.
- C. Water Resistant Gypsum Backing Board: ASTM C620, Type X, 16 mm (5/8 inch) thick.
- D. Gypsum cores shall contain 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, 16 mm (5/8 inch) thick.
- B. ASTM C1177, Type X.

2.3 ACCESSORIES

- A. ASTM C1047, except form of 0.39 mm (0.015 inch) thick zinc coated steel sheet or rigid PVC plastic.
- B. Flanges not less than 22 mm (7/8 inch) wide with punchouts or deformations as required to provide compound bond.

2.4 FASTENERS

- A. ASTM C1002 and ASTM C840, except as otherwise specified.
- B. ASTM C954, for steel studs thicker than 0.04 mm (0.33 inch).
- C. Select screws of size and type recommended by the manufacturer of the material being fastened.
- D. For 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

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 shown (FHP).
 - e. Corridor partitions if the building is not sprinklered.
 - 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 100 mm (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. Use gypsum boards in maximum practical lengths to minimize number of end joints.
- D. Bring gypsum board into contact, but do not force into place.
- E. Ceilings:
 - 1. For single-ply construction, use perpendicular application.
 - 2. For two-ply assemblies:
 - a. Use perpendicular application.
 - b. Apply face ply of gypsum board so that joints of face ply do not occur at joints of base ply with joints over framing members.
- F. Walls (Except Shaft Walls):
 - 1. When gypsum board is installed parallel to framing members, space fasteners 300 mm (12 inches) on center in field of the board, and 200 mm (8 inches) on center along edges.
 - 2. When gypsum board is installed perpendicular to framing members, space fasteners 300 mm (12 inches) on center in field and along edges.
 - 3. Stagger screws on abutting edges or ends.
 - 4. For single-ply construction, apply gypsum board with long dimension either parallel or perpendicular to framing members as required to minimize number of joints except gypsum board shall be applied vertically over "Z" furring channels.
 - 5. For two-ply gypsum board assemblies, apply base ply of gypsum board to assure minimum number of joints in face layer. Apply face ply of wallboard to base ply so that joints of face ply do not occur at joints of base ply with joints over framing members.
 - 6. For three-ply gypsumboard assemblies, apply plies in same manner as for two-ply assemblies, except that heads of fasteners need only be driven flush with surface for first and second plies. Apply third ply of wallboard in same manner as second ply of two-ply assembly, except use fasteners of sufficient length enough to have the same penetration into framing members as required for two-ply assemblies.
 - 7. No offset in exposed face of walls and partitions will be permitted because of single-ply and two-ply or three-ply application requirements.

8. Installing Two Layer Assembly Over Sound Deadening Board:
 - a. Apply face layer of wallboard vertically with joints staggered from joints in sound deadening board over framing members.
 - b. Fasten face layer with screw, of sufficient length to secure to framing, spaced 300 mm (12 inches) on center around perimeter, and 400 mm (16 inches) on center in the field.
9. Control Joints ASTM C840 and as follows:
 - a. Locate at both side jambs of openings if gypsum board is not "yoked". Use one system throughout.
 - b. Not required for wall lengths less than 9000 mm (30 feet).
 - c. Extend control joints the full height of the wall or length of soffit/ceiling membrane.
- G. Acoustical or Sound Rated Partitions, Fire and Smoke Partitions:
 1. Cut gypsum board for a space approximately 3 mm to 6 mm (1/8 to 1/4 inch) wide around partition perimeter.
 2. Coordinate for application of caulking or sealants to space prior to taping and finishing.
 3. Follow ASTM E497 for sound rated partitions. STC minimum values as shown.
- H. Accessories:
 1. Set accessories plumb, level and true to line, neatly mitered at corners and intersections, and securely attach to supporting surfaces as specified.
 2. Install in one piece, without the limits of the longest commercially available lengths.
 3. Corner Beads:
 - a. Install at all vertical and horizontal external corners and where shown.
 - b. Use screws only. Do not use crimping tool.
 4. Edge Trim (casings Beads):
 - a. At both sides of expansion and control joints unless shown otherwise.
 - b. Where gypsum board terminates against dissimilar materials and at perimeter of openings, except where covered by flanges, casings or permanently built-in equipment.

- c. Where gypsum board surfaces of non-load bearing assemblies abut load bearing members.
- d. Where shown.

3.3 FINISHING OF GYPSUM BOARD

- A. Finish joints, edges, corners, and fastener heads in accordance with ASTM C840. Use Level 5 finish for all finished areas open to public view.
- B. Before proceeding with installation of finishing materials, assure the following:
 - 1. Gypsum board is fastened and held close to framing or furring.
 - 2. Fastening heads in gypsum board are slightly below surface in dimple formed by driving tool.
- C. Finish joints, fasteners, and all openings, including openings around penetrations, on that part of the gypsum board extending above suspended ceilings to seal surface of non decorated 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, or fire rated, or sound rated construction.

3.4 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 13 mm (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 13 mm (1/2 inch) diameter, or equivalent size, with 16 mm (5/8 inch) thick gypsum board secured in such a manner as to provide solid substrate equivalent to undamaged surface.
- D. Tape and refinish scratched, abraded or damaged finish surfaces including cracks and joints in non decorated surface to provide smoke tight construction, and/or fire protection equivalent to the fire rated construction, and STC equivalent to the sound rated construction.

3.5 UNACCESSIBLE CEILINGS

At Mental Health and Behavioral Nursing Units, areas accessible to patients and not continuously observable by staff (e.g., patient bedrooms, day rooms), ceilings should be a solid material such as gypsum

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

board. This will limit patient access. Access doors are needed to access electrical and mechanical equipment above the ceiling. These doors should be locked to prevent unauthorized access and secured to ceiling using tamper resistant fasteners.

- - - 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 as specified in drawings.
- C. Remove the existing ceiling within the renovated area and provide new ceiling as specified.
- D. Coordinate acoustical ceiling system with above all ceiling equipment and infrastructure as required.

1.2 RELATED WORK

- A. Access doors in adhesive applied tile

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
 - 3. Runners designed for snap-in attachment of metal pans.
- 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-08.....Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-coated (Galvannealed) by the Hot-Dip Process
C423-08a.....Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
C634/C634M-07).....Standard Terminology Relating to Environmental Acoustics
C635/C635M-07.....Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
C636/C636M-08.....Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
E84-08.....Surface Burning Characteristics of Building Materials
E119-08a.....Fire Tests of Building Construction and Materials
E413-04.....Classification for Rating Sound Insulation.
E580/E580M-08.....Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint
E1264-08.....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.
 - b. Extruded aluminum.
 - c. Fire resistant plastic (glass fiber) having a flame spread and smoke developed rating of not more than 25 when tested in accordance with ASTM E84.
 2. Use same construction for cross runners as main runners. Use of lighter-duty sections for cross runners is not acceptable.

3. Use aluminum suspension in kitchens and aluminum or fire resistant plastic in toilets adjacent to shower areas, hydrotherapy, and swimming pools.
- B. Exposed grid suspension system for support of lay-in panels:
 1. Exposed grid width not less than 22 mm (7/8 inch) with not less than 8 mm (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 specified otherwise.

2.2 PERIMETER SEAL

- A. Vinyl, polyethylene or polyurethane open cell sponge material having density of 1.3 plus or minus 10 percent, compression set less than 10 percent with pressure sensitive adhesive coating on one side.
- B. Thickness as required to fill voids between back of wall molding and finish wall.
- C. Not less than 9 mm (3/8 inch) wide strip.

2.3 WIRE

- A. ASTM A641.
- B. For wire hangers: Minimum diameter 2.68 mm (0.1055 inch).
- C. For bracing wires: Minimum diameter 3.43 mm (0.1350 inch).

2.4 ANCHORS AND INSERTS

- A. Use anchors or inserts to support twice the loads imposed by hangers attached thereto.
- B. Hanger Inserts:
 1. Fabricate inserts from steel, zinc-coated (galvanized after fabrication).
 2. Nailing type option for wood forms:
 - a. Upper portion designed for anchorage in concrete and positioning lower portion below surface of concrete approximately 25 mm (one inch).
 - b. Lower portion provided with not less than 8 mm (5/16 inch) hole to permit attachment of hangers.

3. Flush ceiling insert type:

- a. Designed to provide a shell covered opening over a wire loop to permit attachment of hangers and keep concrete out of insert recess.
- b. Insert opening inside shell approximately 16 mm (5/8 inch) wide by 9 mm (3/8 inch) high over top of wire.
- c. Wire 5 mm (3/16 inch) diameter with length to provide positive hooked anchorage in concrete.

C. Clips:

1. Galvanized steel.
2. Designed to clamp to steel beam or bar joists, or secure framing member together.
3. Designed to rigidly secure framing members together.
4. Designed to sustain twice the loads imposed by hangers or items supported.

D. Tile Splines: ASTM C635.

2.5 CARRYING CHANNELS FOR SECONDARY FRAMING

- A. Fabricate from cold-rolled or hot-rolled steel, black asphaltic paint finish, free of rust.
- B. Weighing not less than the following, per 300 m (per thousand linear feet):

Size mm	Size Inches	Cold-rolled		Hot-rolled	
		Kg	Pound	Kg	Pound
38	1 1/2	215.4	475	508	1120
50	2	267.6	590	571.5	1260

2.6 ACOUSTICAL UNITS

A. General:

1. ASTM E1264, weighing 3.6 kg/m² (3/4 psf) minimum for mineral fiber panels or tile.
2. Class A Flame Spread: ASTM 84
3. Minimum NRC (Noise Reduction Coefficient): 0.55 unless specified otherwise: ASTM C423.
4. Minimum CAC (Ceiling Attenuation Class): 40-44 range unless specified otherwise: ASTM E413.

5. Manufacturers standard finish, minimum Light Reflectance (LR) coefficient of 0.75 on the exposed surfaces, except as specified otherwise. Colored units integrally colored throughout.
6. Lay-in panels: Sizes as shown.
- B. Type III Units - Mineral base with water-based painted finish less than 10 g/l VOC, Form 2 - Water felted, minimum 16 mm (5/8 inch) thick. Mineral base to contain minimum 65 percent recycled content.
- C. Type IV Units - Mineral base with membrane-faced overlay, Form 2 - Water felted, minimum 16 mm (5/8 inch) thick. Apply over the paint coat on the face of the unit a poly (vinyl) chloride overspray having a flame spread index of 25 or less when tested in accordance with ASTM E84.
- D. Type VI Units - Perforated stainless steel facing (pan) with mineral or glass fiber base backing.
- E. Type VII Units - Perforated aluminum facing (pan) with mineral or glass fiber base backing.
 1. Fabricated from aluminum sheets not less than 0.635 mm (0.025 inch) thick.
 2. Apply two coats of baked-on enamel finish, free from gloss or sheen, on face and flanges.
- F. Type III-A Units - Mineral base with painted finish.
 1. Form 1, modular, cast or molded.
 2. Minimum NRC of 0.75.
 3. Minimum thickness of 19 mm (3/4 inch) and weight of 4.9 Kg/sq m (one pound per square foot).

2.7 ACCESS IDENTIFICATION

- A. Markers:
 1. Use colored markers with pressure sensitive adhesive on one side.
 2. Make colored markers of paper or plastic, 6 to 9 mm (1/4 to 3/8 inch) in diameter.
- B. Use markers of the same diameter throughout building.
- C. Color Code: Use following color markers for service identification:

Color.....	Service
Red.....	Sprinkler System: Valves and Controls
Green.....	Domestic Water: Valves and Controls

Yellow.....Chilled Water and Heating Water
Orange.....Ductwork: Fire Dampers
Blue.....Ductwork: Dampers and Controls
Black.....Gas: Laboratory, Medical, Air and Vacuum

PART 3 EXECUTION

3.1 CEILING TREATMENT

- A. Treatment of ceilings shall include sides and soffits of ceiling beams, furred work 600 mm (24 inches) wide and over, and vertical surfaces at changes in ceiling heights unless otherwise shown. Install acoustic tiles after wet finishes have been installed and solvents have cured.
- B. Lay out acoustical units symmetrically about center lines of each room or space unless shown otherwise on reflected ceiling plan.
- C. Moldings:
 - 1. Install metal wall molding at perimeter of room, column, or edge at vertical surfaces.
 - 2. Install special shaped molding at changes in ceiling heights and at other breaks in ceiling construction to support acoustical units and to conceal their edges.
- D. Perimeter Seal:
 - 1. Install perimeter seal between vertical leg of wall molding and finish wall, partition, and other vertical surfaces.
 - 2. Install perimeter seal to finish flush with exposed faces of horizontal legs of wall molding.
- E. Existing ceiling:
 - 1. Where extension of existing ceilings occur, match existing.
 - 2. Where acoustical units are salvaged and reinstalled or joined, use salvaged units within a space. Do not mix new and salvaged units within a space which results in contrast between old and new acoustic units.
 - 3. Comply with specifications for new acoustical units for new units required to match appearance of existing units.

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 1.48 m² (16 sf) of ceiling per hanger.
4. Prevent deflection in excess of 1/360 of span of cross runner and main runner.
5. Provide extra hangers, minimum of one hanger at each corner of each item of mechanical, electrical and miscellaneous equipment supported by ceiling suspension system not having separate support or hangers.
6. Provide not less than 100 mm (4 inch) clearance from the exposed face of the acoustical units to the underside of ducts, pipe, conduit, secondary suspension channels, concrete beams or joists; and steel beam or bar joist unless furred system is shown,
7. Use main runners not less than 1200 mm (48 inches) in length.
8. Install hanger wires vertically. Angled wires are not acceptable except for seismic restraint bracing wires.

B. Anchorage to Structure:

1. Concrete:
 - a. Install hanger inserts and wire loops required for support of hanger and bracing wire in concrete forms before concrete is placed. Install hanger wires with looped ends through steel deck if steel deck does not have attachment device.
 - b. Use eye pins or threaded studs with screw-on eyes in existing or already placed concrete structures to support hanger and bracing wire. Install in sides of concrete beams or joists at mid height.
2. Steel:
 - a. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels for attachment of hanger wires.
 - (1) Size and space carrying channels to insure that the maximum deflection specified will not be exceeded.
 - (2) Attach hangers to steel carrying channels, spaced four feet on center, unless area supported or deflection exceeds the amount specified.

- b. Attach carrying channels to the bottom flange of steel beams spaced not 1200 mm (4 feet) on center before fire proofing is installed. Weld or use steel clips to attach to beam to develop full strength of carrying channel.
 - c. Attach hangers to bottom chord of bar joists or to carrying channels installed between the bar joists when hanger spacing prevents anchorage to joist. Rest carrying channels on top of the bottom chord of the bar joists, and securely wire tie or clip to joist.
- B. Direct Hung Suspension System:
- 1. As illustrated in ASTM C635.
 - 2. Support main runners by hanger wires attached directly to the structure overhead.
 - 3. Maximum spacing of hangers, 1200 mm (4 feet) on centers unless interference occurs by mechanical systems. Use indirect hung suspension system where not possible to maintain hanger spacing.
- C. Indirect Hung Suspension System:
- 1. As illustrated in ASTM C635.
 - 2. Space carrying channels for indirect hung suspension system not more than 1200 mm (4 feet) on center. Space hangers for carrying channels not more than 2400 mm (8 feet) on center or for carrying channels less than 1200 mm (4 feet) on center so as to insure that specified requirements are not exceeded.
 - 3. Support main runners by specially designed clips attached to carrying channels.

3.3 ACOUSTICAL UNIT INSTALLATION

- A. Cut acoustic units for perimeter borders and penetrations to fit tight against penetration for joint not concealed by molding.
- B. Install lay-in acoustic panels in exposed grid with not less than 6 mm (1/4 inch) bearing at edges on supports.
 - 1. Install tile to lay level and in full contact with exposed grid.
 - 2. Replace cracked, broken, stained, dirty, or tile not cut for minimum bearing.
- C. Markers:

1. Install markers of color code specified to identify the various concealed piping, mechanical, and plumbing systems.
2. Attach colored markers to exposed grid on opposite sides of the units providing access.
3. Attach marker on exposed ceiling surface of upward access acoustical unit.

3.4 CLEAN-UP AND COMPLETION

- A. Replace damaged, discolored, dirty, cracked and broken acoustical units.
- B. Leave finished work free from defects.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

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.
Remove existing floor finish, prep surfaces as required to receive new flooring, and install new flooring as specified.

1.2 RELATED WORK

- A. Integral base with sheet flooring: Section 09 65 16, RESILIENT SHEET FLOORING.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Base material manufacturer's recommendations for adhesives.
 - 3. Application and installation instructions.
- C. Samples:
 - 1. Base: 150 mm (6 inches) long, each type and color.
 - 2. Adhesive: Literature indicating each type.

1.4 DELIVERY

- A. Deliver materials to the site in original sealed packages or containers, clearly marked with the manufacturer's name or brand, type and color, production run number and date of manufacture.
- B. Materials from containers which have been distorted, damaged or opened prior to installation will be rejected.

1.5 STORAGE

- A. Store materials in weather tight and dry storage facility.
- B. Protect material from damage by handling and construction operations before, during, and after installation.

1.6 APPLICABLE PUBLICATIONS

- A. The publication listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):

F1344-04.....Rubber Floor Tile
F1859-04.....Rubber Sheet Floor Covering without Backing
F1860-04.....Rubber Sheet Floor Covering with Backing
F1861-08.....Resilient Wall Base

C. Federal Specifications (Fed. Spec.):

RR-T-650E.....Treads, Metallic and Non-Metallic, Nonskid

PART 2 - PRODUCTS

2.1 GENERAL

Use only products by the same manufacturer and from the same production run.

2.2 RESILIENT BASE

- A. Refer to drawings for drawings for finish specification.
- B. ASTM F1861, 3 mm (1/8 inch) thick, 100 mm (4 inches) high, Type TP Rubber, Thermoplastics, Group 2-layered with molded top. Style B-cove.
- C. Where carpet occurs, use Style A-straight.
- D. Use only one type of base throughout.

2.3 PRIMER (FOR CONCRETE FLOORS)

As recommended by the adhesive and tile manufacturer.

2.4 LEVELING COMPOUND (FOR CONCRETE FLOORS)

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 21° C (70 °F), for 48 hours before installation.
- B. Maintain temperature of rooms where work occurs, between 21° C and 27° C (70°F and 80°F) for at least 48 hours, before, during, and after installation.
- C. Do not install materials until building is permanently enclosed and wet construction is complete, dry, and cured.

3.2 INSTALLATION REQUIREMENTS

- A. The respective manufacturer's instructions for application and installation will be considered for use when approved by the Resident Engineer.
- B. Submit proposed installation deviation from this specification to the Resident Engineer indicating the differences in the method of installation.
- C. The Resident Engineer reserves the right to have test portions of material installation removed to check for non-uniform adhesion and spotty adhesive coverage.

3.3 PREPARATION

- A. Examine surfaces on which material is to be installed.
- B. Fill cracks, pits, and dents with leveling compound.
- C. Level to 3 mm (1/8 inch) maximum variations.
- D. Do not use adhesive for leveling or filling.
- E. Grind, sand, or cut away protrusions; grind high spots.
- F. Clean substrate area of oil, grease, dust, paint, and deleterious substances.
- G. Substrate area dry and cured. Perform manufacturer's recommended bond and moisture test.
- H. Preparation of existing installation:
 - 1. Remove existing base and stair treads including adhesive.
 - 2. Do not use solvents to remove adhesives.
 - 3. Prepare substrate as specified.

3.5 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 600 mm (24 inches) length.
 - a. Short pieces to save material will not be permitted.
 - b. Locate joints as remote from corners as the material lengths or the wall configuration will permit.
- C. 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.

3.6 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 two weeks, scrub resilient base, sheet rubber and treads materials with a minimum amount of water and a mild detergent. Leave surfaces clean and free of detergent residue. Polish resilient base to a gloss finish.
 2. Do not polish tread and sheet rubber materials.
- D. When construction traffic is anticipated, cover tread materials with reinforced kraft paper and plywood or hardboard properly secured and maintained until removal is directed by the Resident Engineer.
- E. 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.

- - - E N D - - -

SECTION 09 65 16
RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section specifies the installation of sheet flooring with backing and integral cove base.
- B. Grades of resilient sheet vinyl floor covering without backing having vinyl plastic wearlayer with backing.
- C. Installation of sheet flooring including following:
 - 1. Heat welded seams.
 - 2. Integral cove base: Installed at intersection of floor and vertical surfaces.
- D. The existing flooring is to be removed (and abated) prior to installing new flooring. Refer to Drawings
- E. Coordinate sheet flooring prep and installation with magnetic floor shielding assembly.

1.2 RELATED WORK

- A. Resilient base required over metal base of casework: Section 12 34 00, MANUFACTURED PLASTIC CASEWORK.
- C. Resilient base over base of lockers, equipment and casework: Section 09 65 13, RESILIENT BASE AND ACCESSORIES.
- D. Unbacked vinyl (homogenous) sheet flooring with welded seams: Section 09 65 16, RESILIENT SHEET FLOORING.
- E. Asbestos abatement: Section 02 82 13.19, ASBESTOS FLOOR TILE AND MASTIC ABATEMENT
- F. Integral Cove base over base of Plastic Laminate Healthcare Casework: Section 12 35 70: PLASTIC LAMINATE HEALTHCARE CASEWORK

1.3 QUALITY CONTROL-QUALIFICATIONS:

- A. The Contracting Officer shall approve products or service of proposed manufacturer, suppliers, and installers, and the Contractor shall submit certification that:
 - 1. Heat welded seaming is manufacturer's prescribed method of installation.

2. Installer is approved by manufacturer of materials and has technical qualifications, experience, trained personnel, and facilities to install specified items.
 3. Manufacturer's product submitted has been in satisfactory operation, on three installations similar and equivalent in size to this project for three years. Submit list of installations.
- B. The sheet vinyl floor coverings shall meet fire performance characteristics as determined by testing products, per ASTM test method, indicated below by Underwriters Laboratories, Inc. (UL) or another recognized testing and inspecting agency acceptable to authorities having jurisdiction.
1. Critical Radiant Flux: 0.45 watts per sq. cm or more, Class I, per ASTM E648.
 2. Smoke Density: Less than 450 per ASTM E662.
- C. The floor covering manufacturer shall certify that products supplied for installation comply with local regulations controlling use of volatile organic compounds (VOC's).

1.4 SUBMITTALS

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, submit following:
- B. Manufacturer's Literature and Data:
1. Description of resilient material and accessories to be provided.
 2. Resilient material manufacturer's recommendations for adhesives, weld rods, sealants, and underlayment.
 3. Application and installation instructions.
- C. Samples:
1. Sheet material, 38 mm by 300 mm (1-1/2 inch by 12 inch), of each color and pattern with a welded seam using proposed welding rod, 300 mm (12 inches) square for each type, pattern and color.
 2. Cap strip and fillet strip, 300 mm (12 inches) for integral base.
 3. Shop Drawings and Certificates: Layout of joints showing patterns where joints are expressed, and type and location of obscure type joints. Indicate orientation of directional patterns.
 4. Certificates: Quality Control Certificate Submittals and lists specified in paragraph, QUALIFICATIONS.

- 5. Edge strips: 150 mm (6 inches) long each type.
- 6. Adhesive, underlayment and primer: Pint container, each type.

1.5 PROJECT CONDITIONS

- A. Maintain temperature of floor materials and room, where work occurs, above 18 ° C (65 °F) and below 38 ° C (100 °F) for 48 hours before, during and for 48 hours after installation. After above period, room temperature shall not fall below 13 ° C (55 °F).
- B. Construction in or near areas to receive flooring work shall be complete, dry and cured. Do not install resilient flooring over slabs until they have been cured and are sufficiently dry to achieve a bond with adhesive. Follow flooring manufacturer's recommendations for bond and moisture testing.
- C. 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 extent referenced. Publications are referenced in text by basic designation only.
- B. American Society For Testing Materials (ASTM):
 - E648-08.....Critical Radiant Flux of Floor-Covering Systems
Using a Radiant Energy Source.

E662-06e1.....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.....Sheet Vinyl Floor Covering with Backing.

F1913-04.....Sheet Vinyl Flooring without Backing

C. Resilient Floor Covering Institute (RFCI):

Recommended Work Practices for Removal of Resilient Floor Coverings.

1.8 SCHEDULING

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:

Submit written warranty, in accordance with FAR clause 52.246-21, Warranty of Construction requirements except that warranty period shall be extended to include two (2) years.

PART 2 - PRODUCTS

2.1 SHEET VINYL FLOOR COVERINGS

- A. Sheet Vinyl Floor Coverings: Smooth face, minimum thickness nominal 2 mm (0.08 inch). Sheet flooring shall conform to ASTM F1913 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 - 1200 mm (48 inches).
- C. Each color and pattern of sheet flooring shall be of same production run.
- D. Refer to drawings for types.

2.2 WELDING ROD:

Product of floor covering manufacturer in color shall match field color of sheet vinyl covering.

2.3 APPLICATION MATERIALS AND ACCESSORIES

- A. Floor and Base Adhesive: Type recommended by sheet flooring material manufacturer for conditions of use.
- B. Mastic Underlayment (for concrete floors): Provide products with latex or polyvinyl acetate resins in mix. Condition to be corrected shall determine type of underlayment selected for use.
- C. Base Accessories:
 - 1. Fillet Strip: 19 mm (3/4 inch) radius fillet strip compatible with resilient sheet material.
 - 2. Cap Strip: Extruded flanged zero edge vinyl reducer strip approximately 25 mm (one inch) exposed height with 13 mm (1/2 inch) flange.

2.4 SHEET FLOORING

- A. ASTM F1303, Type II, Grade 1, except for backing requirements. Foam backed sheet flooring is not acceptable.
- B. Minimum nominal thickness 2 mm (0.08 inch); 1800 mm (6 ft) 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

Water resistant type recommended by the sheet flooring manufacturer for the conditions of use.

2.6 BASE CAP STRIP AND COVE STRIP

- A. Extruded vinyl compatible with the sheet flooring.
- B. Cap strip "J" shape with feathered edge flange approximately 25 mm (one inch) wide; top designed to receive sheet flooring with 13 mm (1/2 inch) flange lapping top of flooring
- C. Cove strip 70 mm (2-3/4 inch) radius.

2.7 LEVELING COMPOUND (FOR CONCRETE FLOORS)

Provide cementitious products with latex or polyvinyl acetate resins in the mix.

2.8 LEVELING COMPOUND/PRIMER (FOR MAGNETIC FLOOR SHIELDING)

As recommended by the adhesive or sheet flooring manufacturer over the specific shielding materials for the specific use and use conditions.

2.9 PRIMER (FOR CONCRETE SUBFLOORS)

As recommended by the adhesive or sheet flooring manufacturer.

2.10 EDGE STRIPS

- A. Rubber, Color to match new flooring.
 - B. 1-5/8 inch wide, 1/4 inch thick, bevel one edge to 1/8 inch thick.
 - C. Fully adhesively adhere edge strip to flooring. Adhesive to be as recommended by the floor accessory or sheet flooring manufacturer.
- Install per manufacturer's recommendations.

2.11 SEALANT

- A. Compatible with sheet flooring.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

- A. Maintain temperature of sheet flooring above 36 °C (97 °F), for 48 hours before installation.
- B. Maintain temperature of rooms where sheet flooring work occurs above 36 °C (97 °F), for 48 hours, before installation and during installation.
- C. After installation, maintain temperature at or above 36 °C (97 °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. Installation for Resilient Flooring over existing VCT (Asbestos Containing Material)
 - 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. Substrates shall be 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.
3. Remove all existing topical sealers and wax materials using a commercial grade stripper. This can be heavily alkaline or acidic. Consult your chemical supplier prior to stripping. Follow manufacturer's directions, and remove all waxes. Etch the floor with stripper to prep the substrate for adhering floor patch.
4. Rinse floor thoroughly and vacuum up all liquids.
5. When the floor is dry either trowel a cementitious patch material such as Ardex Feather Finish or similar. A self-leveling material may also be used.
6. Sand smooth when dry.
- 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 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. Subfloor Testing:

Determine adhesion and dryness of the floor by bond and moisture tests as recommended by RFCI manual MPR.

3.2 INSTALLATION OF FLOORING

- A. Install work in strict compliance with manufacturer's instructions and approved layout drawings.
- B. Maintain uniformity of sheet vinyl floor covering direction and avoid cross seams.
- C. Arrange for a minimum number of seams and place them in inconspicuous and low traffic areas, but in no case less than 150 mm (6 inches) away from parallel joints in flooring substrates.
- D. Match edges of resilient floor coverings for color shading and pattern at seams.
- E. Where resilient sheet flooring abuts other flooring material floors shall finish level.
- F. Extend sheet vinyl floor coverings into toe spaces, door reveals, closets, and similar openings.
- G. Inform the Resident Engineer of conflicts between this section and the manufacturer's instructions or recommendations for auxiliary materials, or installation methods, before proceeding.
- H. Install sheet in full coverage adhesives.
 - 1. Air pockets or loose edges will not be accepted.
 - 2. Trim sheet materials to touch in the length of intersection at pipes and vertical projections; seal joints at pipe with waterproof cement or sealant.
- I. Keep joints to a minimum; avoid small filler pieces or strips.
- J. Follow manufacturer's recommendations for seams at butt joints. Do not leave any open joints that would be readily visible from a standing position.
- K. Follow manufacturer's recommendations regarding pattern match, if applicable.
- L. Installation of Edge Strips:
 - 1. Locate edge strips under center lines of doors unless otherwise indicated.

2. Set aluminum strips in adhesive, anchor with lead anchors and stainless steel Phillips screws.

M. Integral Cove Base Installation:

1. Set preformed fillet strip to receive base.
2. Install the base with adhesive, terminate exposed edge with the cap strip.
3. Form internal and external corners to the geometric shape generated by the cove at either straight or radius corners.
4. Solvent weld joints as specified for the flooring. Seal cap strip to wall with an adhesive type sealant.
5. Unless otherwise specified or shown where sheet flooring is scheduled, provide integral base at intersection of floor and vertical surfaces. Provide sheet flooring and base scheduled for room on floors and walls under and behind areas where casework, laboratory and pharmacy furniture and other equipment occurs, except where mounted in wall recesses.

3.3 INSTALLATION OF INTEGRAL COVED BASE

- A. Set preformed cove to receive base. Install base material with adhesive and terminate exposed edge with cap strip. Integral base shall be 100 mm (4 inches) high.
- B. Internal and external corners shall be formed to geometric shape generated by cove at either square or radius corners.

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 and polish materials per flooring manufacturer's written recommendations.
- D. Vacuum floor thoroughly.
- E. Do not wash floor until after period recommended by floor covering manufacturer and then prepare in accordance with manufacturer's recommendations.
- F. Upon completion, Resident Engineer 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, re-clean sheet flooring, lightly re-apply polish and buff floor.

- - - E N D - - -

SECTION 09 65 19
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the installation of solid vinyl tile flooring, vinyl composition tile flooring, rubber tile flooring, and accessories.
- B. Remove existing floor finish, prep surfaces as required to receive new flooring, and install new flooring as specified.

1.2 RELATED WORK

- A. Color and pattern and location in room finish schedule.
- B. Resilient Base: Section 09 65 13, RESILIENT BASE AND ACCESSORIES.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Description of each product.
 - 2. Resilient material manufacturers recommendations for adhesives, underlayment, primers and polish.
 - 3. Application and installation instructions.
- C. Samples:
 - 1. Tile: 300 mm by 300 mm (12 inches by 12 inches) for each type, pattern and color.
 - 2. Edge Strips: 150 mm (6 inches) long, each type.
 - 3. Feature Strips: 150 mm (6 inches) long.
- D. Shop Drawings:
 - 1. Layout of patterns shown on the drawings and in Section 09 06 00, SCHEDULE FOR FINISHES.
 - 2. Edge strip locations showing types and detail cross sections.
- E. Test Reports:
 - 1. Abrasion resistance: Depth of wear for each tile type and color and volume loss of tile, certified by independent laboratory.
 - 2. Tested per ASTM F510.

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 weathertight and dry storage facility.
- B. Protect from damage from handling, water, and temperature.

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):
 - D4078-02 (2008).....Water Emulsion Floor Finish
 - E648-08.....Critical Radiant Flux of Floor Covering Systems
Using a Radiant Energy Source
 - E662-06e1.....Specific Optical Density of Smoke Generated by
Solid Materials
 - E1155-96 (2008).....Determining Floor Flatness and Floor Levelness
Numbers
 - F510-93 (2004).....Resistance to Abrasion of Resilient Floor
Coverings Using an Abrader with a Grit Feed
Method
 - F710-08.....Preparing Concrete Floors to Receive Resilient
Flooring
 - F1066-04.....Vinyl Composition Floor Tile
 - F1344-04.....Rubber Floor Tile
 - F1700-04.....Solid Vinyl Floor Tile
- C. Resilient Floor Covering Institute (RFCI):
 - IP #2.....Installation Practice for Vinyl Composition Tile
(VCT)
- D. Federal Specifications (Fed. Spec.):
 - SS-T-312.....Tile Floor: Asphalt, Rubber, Vinyl and Vinyl
Composition

PART 2 - PRODUCTS

2.1 GENERAL

- A. Furnish product type, materials of the same production run and meeting following criteria.
- B. Use adhesives, underlayment, primers and polish recommended by the floor resilient material manufacturer.
- C. Critical Radiant Flux: 0.45 watts per sq. cm or more, Class I, per ASTM E 648.
- D. Smoke density: Less than 450 per ASTM E662.

2.2 VINYL COMPOSITION TILE

- A. ASTM F1066, Composition 1, Class I (solid color), Class 2 (through pattern), 300 mm (12 inches) square, 3 mm (1/8 inch) thick.
- B. Color and pattern uniformly distributed throughout thickness.

2.3 SOLID VINYL-TILE

- A. ASTM F1700, 300 mm (12 by 12 inches) square, 3 mm (1/8 inch) thick, homogenous throughout.
- B. Color and Pattern uniformly distributed throughout thickness.
- C. Where solid vinyl tiles are specified, seek products with recycled content.

2.4 ADHESIVES

- A. Comply with applicable regulations regarding toxic and hazardous materials Green Seal (GS-36) for commercial adhesive.
- B. Use low-VOC adhesive during installation. Water based is preferred over solvent based adhesives.

2.5 PRIMER (FOR CONCRETE SUBFLOORS)

As recommended by the adhesive and tile manufacturer.

2.6 LEVELING COMPOUND (FOR CONCRETE FLOORS)

- A. Provide cementitious products with latex or polyvinyl acetate resins in the mix.
- B. Determine the type of underlayment selected for use by the condition to be corrected.

2.7 POLISH AND CLEANERS

- A. Cleaners RFCI CL-1.
- B. Polish: ASTM D4078.

2.8 EDGE STRIPS

- A. 28 mm (1-1/8 inch) wide unless shown otherwise.
- B. Bevel from maximum thickness to minimum thickness for flush joint unless shown otherwise.
- C. Extruded aluminum, mill finish, mechanically cleaned:
 - 1. Drill and counter sink edge strip for flat head screws.
 - 2. Space holes near ends and approximately 225 mm (9 inches) on center between.
- D. Resilient Edge Strip or Reducer Strip: Fed. Specs. SS-T-312, Solid vinyl.

2.9 SCREWS

Stainless steel flat head screw.

PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

- A. Maintain temperature of materials a minimum of 22 °C (; °F,) for 48 hours before installation.
- B. Maintain temperature of rooms where work occurs between 21 °C and 27 °C (70 °F and 80 °F), for at least 48 hours, before, during and after installation.
- C. Do not install flooring until building is permanently enclosed and wet construction in or near areas to receive tile materials is complete, dry and cured.

3.2 SUBFLOOR PREPARATION

- A. Verify that concrete slabs comply with ASTM F710. At existing slabs, determine levelness by F-number method in accordance with ASTM E1155. Overall value shall not exceed as follows:
 - FF30/FL20
- B. Correct conditions which will impair proper installation.
- C. Fill cracks, joints 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 joints.
- D. Clean floor of oil, paint, dust, and deleterious substances: Leave floor dry and cured free of residue from existing curing or cleaning agents.
- E. Concrete Subfloor Testing:
Determine Adhesion and dryness of the floor by bond and moisture tests as recommended by RFCI manual MRP.
- F. Perform additional subfloor preparation to obtain satisfactory adherence of flooring if subfloor test patches allows easy removal of tile.
- G. Prime the concrete subfloor if the primer will seal slab conditions that would inhibit bonding, or if priming is recommended by the tile or adhesive manufacturers.
- H. Preparation of existing installation shall include the removal of existing resilient floor and existing adhesive. Do not use solvents to remove adhesives.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions for application and installation unless specified otherwise.
- B. Mix tile from at least two containers. An apparent line either of shades or pattern variance will not be accepted.
- C. Tile Layout:
 1. If layout is not shown on drawings, lay tile symmetrically about center of room or space with joints aligned.
 2. No tile shall be less than 150 mm (6 inches) and of equal width at walls.
 3. Place tile pattern in the same direction; do not alternate tiles.
- D. Trim tiles to touch for the length of intersections at pipes and vertical projections, seal joints at pipes with waterproof cement.
- E. Application:
 1. Apply adhesive uniformly with no bare spots.
 - a. Conform to RFC1-TM-6 for joint tightness and for corner intersection unless layout pattern shows random corner intersection.
 - b. More than 5 percent of the joints not touching will not be accepted.

2. Roll tile floor with a minimum 45 kg (100 pound) roller. No exceptions.
3. The Resident Engineer may have test tiles removed to check for non-uniform adhesion, spotty adhesive coverage, and ease of removal. Install new tile for broken removed tile.

F. Installation of Edge Strips:

1. Locate edge strips under center line of doors unless otherwise shown.
2. Set resilient edge strips in adhesive. Anchor metal edge strips with anchors and screws specified.
3. Where tile edge is exposed, butt edge strip to touch along tile edge.
4. Where thin set ceramic tile abuts resilient tile, set edge strip against floor file and against the ceramic tile edge.

3.4 CLEANING AND PROTECTION

- A. Clean adhesive marks on exposed surfaces during the application of resilient materials before the adhesive sets. Exposed adhesive is not acceptable.
- B. Keep traffic off resilient material for a minimum 72 hours after installation.
- C. Clean and polish materials in the following order:
 1. For the first two weeks sweep and damp mopped only.
 2. After two weeks, scrub resilient materials with a minimum amount of water and a mild detergent. Leave surface clean and free of detergent residue.
 3. Apply polish to the floors in accordance with the polish manufacturer's instructions.
- D. When construction traffic occurs over tile, cover resilient materials with reinforced kraft paper properly secured and maintained until removal is directed by Resident Engineer. At entrances and where wheeled vehicles or carts are used, cover tile with plywood, hardboard, or particle board over paper, secured and maintained until removal is directed by Resident Engineer.
- E. When protective materials are removed and immediately prior to acceptance, replace any damage tile, re-clean resilient materials, lightly re-apply polish and buff floors.

3.6 LOCATION

- A. Unless otherwise specified or shown, install tile flooring, on floor under areas where casework, laboratory and pharmacy furniture and other equipment occurs, except where mounted in wall recesses.
- B. Extend tile flooring for room into adjacent closets and alcoves.

- - - E N D - - -

THIS PAGE INTENTIONALLY LEFT BLANK

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 stripping or markers and identity markings.
- D. Unless items are pre-finished, or scheduled to receive finish, all items exposed to view shall receive paint to match adjacent surfaces. Refer to instructions herein for the appropriate paint for the specific type of materials.
- E. Refer to drawings for finish schedule and finish legend.

1.2 RELATED WORK

- A. Shop prime painting of steel and ferrous metals: Divisions 8, 10, 12, 22, 23, 26, 27, 28 sections.
- B. Contractor option: Pre-finished flush doors with transparent finishes: Section, 08 14 00 WOOD DOORS.
- C. Type of Finish and Color- refer to 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, 102 mm by 254 mm by 3 mm (4 inch by 10 inch by 1/8 inch).
3. Panel to show transparent finishes: Wood of same species and grain pattern as wood approved for use, 102 by 254 by 3 mm (4 inch by 10 inch face by 1/4 inch) thick minimum, and where both flat and edge grain will be exposed, 254 mm (10 inches) long by sufficient size, 51 mm by 51 mm (2 by 2 inch) minimum or actual wood member to show complete finish.
4. Attach labels to panel stating the following:
 - a. Federal Specification Number or manufacturers name and product number of paints used.
 - b. Product type and color.
 - c. Name of project.
5. Strips showing not less than 51 mm (2 inch) wide strips of undercoats and 102 mm (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. High temperature aluminum paint.
3. Epoxy coating.
4. Intumescent clear coating or fire retardant paint.
5. Plastic floor 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 18 and 30 degrees C (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 9 m² (100 ft²), selected by Resident Engineer.
- B. Finish and texture approved by Resident Engineer 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 and should be of the latest edition available.
- B. American Conference Of Governmental Industrial Hygienists (ACGIH):
- ACGIH TLV-BKLT.....Threshold Limit Values (TLV) for Chemical
Substances and Physical Agents and Biological
Exposure Indices (BEIs)
- ACGIH TLV-DOC.....Documentation of Threshold Limit Values and
Biological Exposure Indices, (Sixth Edition)
- C. American National Standards Institute (ANSI):
- A13.1.....Scheme for the Identification of Piping Systems
- D. American Society for Testing and Materials (ASTM):
- D260.....Boiled Linseed Oil
- E. Commercial Item Description (CID):

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

A-A-378.....Putty, Linseed Oil Type (For Wood Sash Glazing)
(cancelled)

A-A-1272.....Plaster, Gypsum (Spackling Compound)

A-A-1555.....Water Paint, Powder (Cementitious, White and
Colors) (WPC) (cancelled)

A-A-2335.....Sealer, Surface (Varnish Type, Wood and Cork
Floors) (cancelled)

A-A-3120.....Paint, For Swimming Pools (RF) (cancelled)

F. Federal Specifications (Fed Spec):

P-W-155C.....Wax Floor, Water-Emulsion INT AMD 1

TT-F-322D.....Filler, Two-Component Type, For Dents, Cracks
INT AMD 1.....Small-Hole and Blow-Holes

TT-F-340C.....Filler, Wood, Plastic

TT-P-1411A.....Paint, Copolymer-Resin, Cementitious (For
Waterproofing Concrete and Masonry Walls) (CEP)

G. Master Painters Institute (MPI):

No. 1.....Aluminum Paint (AP)

No. 4.....Interior/ Exterior Latex Block Filler

No. 5.....Exterior Alkyd Wood Primer

No. 7.....Exterior Oil Wood Primer

No. 8.....Exterior Alkyd, Flat (EO)

No. 9.....Exterior Alkyd Enamel (EO)

No. 10.....Exterior Latex, Flat (AE)

No. 11.....Exterior Latex, Semi-Gloss (AE)

No. 18.....Organic Zinc Rich Coating

No. 22.....High Heat Resistant Coating (HR)

No. 26.....Cementitious Galvanized Metal Primer

No. 27.....Exterior / Interior Alkyd Floor Enamel, Gloss (FE)

No. 31.....Polyurethane, Moisture Cured, Clear Gloss (PV)

No. 36.....Knot Sealer

No. 43.....Interior Satin Latex

No. 44.....Interior Low Sheen Latex

No. 45.....Interior Primer Sealer

No. 46.....Interior Enamel Undercoat

No. 47.....Interior Alkyd, Semi-Gloss (AK)

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

No. 48.....Interior Alkyd, Gloss (AK)
No. 49.....Interior Alkyd, Flat (AK)
No. 50.....Interior Latex Primer Sealer
No. 51.....Interior Alkyd, Eggshell
No. 52.....Interior Latex, MPI Gloss Level 3 (LE)
No. 53.....Interior Latex, Flat, MPI Gloss Level 1 (LE)
No. 54.....Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE)
No. 59.....Interior/Exterior Alkyd Porch & Floor Enamel, Low
Gloss (FE)
No. 60.....Interior/Exterior Latex Porch & Floor Paint, Low
Gloss
No. 66.....Interior Alkyd Fire Retardant, Clear Top-Coat (ULC
Approved) (FC)
No. 67.....Interior Latex Fire Retardant, Top-Coat (ULC
Approved) (FR)
No. 68.....Interior/ Exterior Latex Porch & Floor Paint,
Gloss
No. 71.....Polyurethane, Moisture Cured, Clear, Flat (PV)
No. 77.....Epoxy Cold Cured, Gloss (EC)
No. 79.....Marine Alkyd Metal Primer
No. 90.....Interior Wood Stain, Semi-Transparent (WS)
No. 91.....Wood Filler Paste
No. 94.....Exterior Alkyd, Semi-Gloss (EO)
No. 95.....Fast Drying Metal Primer
No. 98.....High Build Epoxy Coating
No. 101.....Cold Curing Epoxy Primer
No. 108.....High Build Epoxy Marine Coating (EC)
No. 114.....Interior Latex, Gloss (LE) and (LG)
No. 119.....Exterior Latex, High Gloss (acrylic) (AE)
No. MPI 135.....Non-Cementitious Galvanized Primer
No. 138.....Interior High Performance Latex, MPI Gloss Level 2
(LF)
No. 139.....Interior High Performance Latex, MPI Gloss Level 3
(LL)
No. 140.....Interior High Performance Latex, MPI Gloss Level 4

No. 141.....Interior High Performance Latex (SG) MPI Gloss
Level 5

H. Steel Structures Painting Council (SSPC):

SSPC SP 1.....Solvent Cleaning

SSPC SP 2.....Hand Tool Cleaning

SSPC SP 3.....Power Tool Cleaning

I. Western Wood Products Association (WWPA):

Research Note 312- Revised Jan 30, 1985 Painting Over Knots

PART 2 - PRODUCTS

2.1 MATERIALS

A. Floor Wax: Fed Spec P-W-155 (Wax Floor, Water-Emulsion).

B. Putty: Fed Spec A-A-378, Type II (Putty, Linseed Oil Type).

C. Wood Sealer: MPI 31 (gloss) or MPI 71 (flat) thinned with thinner
recommended by manufacturer at rate of about one part of thinner to four
parts of varnish.

D. Identity markers options:

1. Pressure sensitive vinyl markers.

2. Snap-on coil plastic markers.

E. Aluminum Paint (AP): MPI 1.

F. Interior/Exterior Latex Block Filler: MPI 4.

G. Organic Zinc rich Coating (HR): MPI 22.

H. High Heat Resistant Coating (HR): MPI 22.

I. Cementitious Galvanized Metal Primer: MPI 26.

J. Exterior/ interior Alkyd Floor Enamel, Gloss (FE): MPI 27.

K. Knot Sealer: MPI 36.

L. Interior Satin Latex: MPI 43.

M. Interior Low Sheen Latex: MPI 44.

N. Interior Primer Sealer: MPI 45.

O. Interior Enamel Undercoat: MPI 47.

P. Interior Alkyd, Semi-Gloss (AK): MPI 47.

Q. Interior Alkyd, Gloss (AK): MPI 49.

R. Interior Latex Primer Sealer: MPI 50.

S. Interior Alkyd, Eggshell: MPI 51

T. Interior Latex, MPI Gloss Level 3 (LE): MPI 52.

- U. Interior Latex, Flat, MPI Gloss Level 1 (LE): MPI 53.
- V. Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE): MPI 54.
- W. Interior / Exterior Alkyd Porch & Floor Enamel, Low Gloss (FE): MPI 59.
- X. Interior/ Exterior Latex Porch & Floor Paint, Low Gloss: MPI 60.
- Y. Interior Alkyd Fire Retardant, Clear Top-Coat (ULC Approved) (FC): MPI 66.
- Z. Interior Latex Fire Retardant, Top-Coat (ULC Approved) (FR): MPI 67.
- AA. Interior/ Exterior Latex Porch & Floor Paint, gloss: MPI 68.
- BB. Epoxy Cold Cured, Gloss (EC): MPI 77.
- CC. Marine Alkyd Metal primer: MPI 79.
- DD. Interior Wood Stain, Semi-Transparent (WS): MPI 90.
- EE. Wood Filler Paste: MPI 91.
- FF. Fast Drying Metal Primer: MPI 95.
- GG. Cold Curing Epoxy Primer: MPI 101.
- HH. Interior latex, Gloss (LE) and (LG): MPI 114.
- II. Waterborne Galvanized Primer: MPI 134.
- JJ. Non-Cementitious Galvanized Primer: MPI 135.
- KK. Interior High Performance Latex, MPI Gloss Level 2 (LF): MPI 138.
- LL. Interior High Performance Latex, MPI Gloss Level 3 (LL): MPI 139.
- MM. Interior High Performance Latex, MPI Gloss Level 4: MPI 140.
- NN. Interior High Performance Latex (SG), MPI Gloss Level 5: MPI 141.

2.2 PAINT PROPERTIES

- A. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.
- B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.

2.3 REGULATORY REQUIREMENTS

- 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 local, state or district requirements.
 - 2. Lead-Base 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.

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 3 degrees C (5 degrees F) above dew point.
 - b. Below 10 degrees C (50 degrees F) or over 35 degrees C (95 degrees F), unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.
 2. Maintain interior temperatures until paint dries hard.
 3. Do not paint in direct sunlight or on surfaces that the sun will soon warm.
 4. Varnishing:

- a. Apply in clean areas and in still air.
- b. Before varnishing vacuum and dust area.
- c. Immediately before varnishing wipe down surfaces with a tack rag.

3.2 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 pre-finished 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 TT-F-340C (Filler, Wood, Plastic) or A-A-378 (Putty, Linseed Oil Type). Use TT-F-340C (Filler, Wood, Plastic) for transparent finish, to match wood. Sand the surface to make smooth and finish flush with adjacent surface.
 6. Before applying finish coat, reapply TT-340C (Filler, Wood, Plastic) or A-A-378 (Putty, Linseed Oil Type) 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 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. 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 25 mm (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 two component and two part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.
- E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

3.4 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 three coats; prime, body, and finish. When two 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 Resident Engineer.
- E. Finish surfaces to show solid even color, free from runs, lumps, brush marks, 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 Resident Engineer, 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 sterilizes and other recessed equipment and similar pre-finished items.
- I. 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 and Wood Particleboard:
 - 1. Use same kind of primer specified for exposed face surface.
 - a. Exterior wood: MPI 7 (Exterior Oil Wood Primer) for new construction and MPI 5 (Exterior Alkyd Wood Primer) for repainting bare wood primer except where MPI 90 (Interior Wood Stain, Semi-Transparent (WS)) is scheduled.

- b. Interior wood except for transparent finish: MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat), thinned if recommended by manufacturer.
- 2. Apply two coats of primer MPI 7 (Exterior Oil Wood Primer) or MPI 5 (Exterior Alkyd Wood Primer) or sealer MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat) to surfaces of wood doors, including top and bottom edges, which are cut for fitting or for other reason.
- 3. Apply one coat of primer MPI 7 (Exterior Oil Wood Primer) or MPI 5 (Exterior Alkyd Wood Primer) or sealer MPI 45 (Interior Primer Sealer) or MPI 46 (Interior Enamel Undercoat) as soon as delivered to site to surfaces of unfinished woodwork, except concealed surfaces of shop fabricated or assembled millwork and surfaces specified to have varnish, stain or natural finish.
- 4. Back prime and seal ends of exterior woodwork, and edges of exterior plywood specified to be finished.
- 5. Apply MPI 67 (Interior Latex Fire Retardant, Top-Coat (ULC Approved) (FR) to wood for fire retardant finish.
- F. Metals except boilers, incinerator stacks, and engine exhaust pipes:
 - 1. Steel and iron: MPI 79 (Marine Alkyd Metal Primer). Use MPI 101 (Cold Curing Epoxy Primer) where MPI 77 (Epoxy Cold Cured, Gloss (EC) finish is specified.
 - 2. Zinc-coated steel and iron: MPI 134 (Waterborne Galvanized Primer).
 - 3. Aluminum scheduled to be painted: MPI 95 (Fast Drying Metal Primer).
 - 4. Terne Metal: MPI 79 (Marine Alkyd Metal Primer).
 - 5. Copper and copper alloys scheduled to be painted: MPI 95 (Fast Drying Metal Primer).
 - 6. Machinery not factory finished: MPI 9 (Exterior Alkyd Enamel (EO)).
 - 7. Asphalt coated metal: MPI 1 (Aluminum Paint (AP)).
 - 8. Metal over 94 degrees C. (200 degrees F), Boilers, Incinerator Stacks, and Engine Exhaust Pipes: MPI 22 (High Heat Resistant Coating (HR)).
- G. Gypsum Board:
 - 1. Surfaces scheduled to have MPI 10 (Exterior Latex, Flat (AE)
 - 2. Primer: MPI 50 (Interior Latex Primer Sealer) except use MPI 45 (Interior Primer Sealer).

3. Surfaces scheduled to receive vinyl coated fabric wall covering:
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)).

H. Gypsum Plaster and Veneer Plaster:

1. Surfaces scheduled to receive vinyl coated fabric wall-covering:
Use MPI 45 (Interior Primer Sealer).
2. MPI 45 (Interior Primer Sealer), except use MPI 50 (Interior Latex Primer Sealer) when an alkyd flat finish is specified.

3.7 INTERIOR FINISHES

A. Apply following finish coats over prime coats in spaces and/or as scheduled.

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 two coats of MPI 47 (Interior Alkyd, Semi-Gloss (AK)) unless specified otherwise.
 - b. Two coats of MPI 48 (Interior Alkyd Gloss (AK)).
 - c. One coat of MPI 46 (Interior Enamel Undercoat) plus one coat of MPI 47 (Interior Alkyd, Semi-Gloss (AK)) on exposed interior surfaces of alkyd-amine enamel prime finished windows.
 - d. Two coats of CID-A-A3120 Type E (RP) on exposed surfaces in pool area and chlorinator rooms.
 - e. Machinery: One coat MPI 9 (Exterior Alkyd Enamel (EO)).
 - f. Asphalt Coated Metal: One coat MPI 1 (Aluminum Paint (AP)).
 - g. Ferrous Metal over 94 degrees K (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 one coat of MPI 139 (Interior High Performance Latex, MPI Gloss level 3 (LL)).

2. Two coats of MPI 138 (Interior High Performance Latex, MPI Gloss Level 2 (LF)).
3. One coat of MPI 45 (Interior Primer Sealer), plus one coat of MPI 54 (Interior Latex, Semi-Gloss, MPI Gloss Level 5 (LE)) or MPI 114 (Interior Latex, Gloss (LE) and (LG)).
4. One coat of MPI 45 (Interior Primer Sealer), plus one coat of MPI 48 (Interior Alkyd Gloss (AK)).

D. Plaster:

1. One coat of MPI 45 (Interior Primer Sealer), plus one coat of MPI 139 (Interior High Performance Latex, MPI Gloss level 3 (LL)).
2. Two coats of MPI 51 (Interior Alkyd, Eggshell) (AK)).
3. One coat of MPI 45 (Interior Primer Sealer), plus one coat of 139 (Interior High Performance Latex, MPI Gloss level 3 (LL)).
4. One coat MPI 101 (Cold Curing Epoxy Prime (EC)).

E. Masonry and Concrete Walls:

1. Over MPI 4 (Interior/Exterior Latex Block Filler) on CMU surfaces.
2. Two coats of MPI 53 (Interior Latex, Flat, MPI Gloss Level 1 (LE)).
3. Two coats of MPI 138 (Interior High Performance Latex, MPI Gloss Level 2 (LF)).

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:
 - a. One coat of MPI 46 (Interior Enamel Undercoat), plus one coat of MPI 47 (Interior Alkyd, Semi-Gloss (AK)) (SG).

- b. One coat MPI 66 (Interior Alkyd Fire retardant, Clear Top-Coat (ULC Approved) (FC)).
- c. One coat of MPI 46 (Interior Enamel Undercoat), plus one coat of MPI 48 (Interior Alkyd Gloss (AK)).
- d. Two coats of MPI 51 (Interior Alkyd, Eggshell) (AK)).
- 4. Transparent Finishes on Wood Except Floors.
 - a. Natural Finish:
 - 1) One coat of sealer as written in 2.1 E.
 - 2) Two coats of MPI 71 (Polyurethane, Moisture Cured, Clear Flat (PV), or MPI 31 (Polyurethane, Moisture Cured, Clear Gloss (PV)).
 - b. 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 71 (Polyurethane, Moisture Cured, Clear Flat (PV), or MPI 31 (Polyurethane Moisture Cured, Clear Gloss (PV)).
 - c. Varnish Finish:
 - 1) One coat of sealer as written in 2.1 E.
 - 2) Two coats of MPI 71 (Polyurethane, Moisture Cured, Clear Flat (PV), or MPI 31 (Polyurethane Moisture Cured, Clear Gloss (PV)).
 - d. MPI 66 (Interior Alkyd Fire Retardant, Clear Top-Coat (ULC Approved) (FC)) Intumescent Type, Fire Retardant Coating (FC) where scheduled: Two coats.
- G. Cement Board: One coat of MPI 138 (Interior High Performance Latex, MPI Gloss Level 2 (LF)).
- H. Concrete Floors: One coat of MPI 68 (Interior/ Exterior Latex Porch & Floor Paint, Gloss (FE)).
- I. Miscellaneous:
 - 1. MPI 1 (Aluminum Paint): Two coats of aluminum paint.
 - 2. Gold Paint (GP): Two coats of gold paint.
 - 3. Existing acoustical units scheduled to be repainted except acoustical units with a vinyl finish:
 - a. Clean units free of dust, dirt, grease, and other deterrents to paint adhesion.

- b. Mineral fiber units: One coat of MPI 53 (Interior Latex, Flat, MPI Gloss Level 1 (LE)).
- c. Units of organic fiber or other material not having a class A rating: One coat of MPI 66 (Interior Alkyd Fire Retardant, Clear Top-Coat (ULC Approved) (FC)) fire retardant paint.
- 5. Interstitial floor markings: One coat MPI 27 (Exterior/ Interior Alkyd Floor Enamel, Gloss (FE)).

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), or MPI 71 (Polyurethane, Moisture Cured, Clear Flat (PV)).
- 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 specified in 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 to not show through the finish coat and to mask surface imperfections or contrasts.
- D. Painting, Caulking, Closures, and Fillers Adjacent to Casework:
 - 1. Paint to match color of casework where casework has a paint finish.
 - 2. Paint to match color of wall where casework is stainless steel, plastic laminate, or varnished wood.

3.10 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.
- C. Paint various systems specified in Divisions 2,22,23.
- 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 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 especially 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:
 - 1. Paint items having no color specified to match surrounding surfaces.
 - 2. Paint colors as specified, except for following:
 - a. WhiteExterior unfinished surfaces of enameled plumbing fixtures. Insulation coverings on breeching and uptake

inside boiler house, drums and drum-heads, oil heaters, condensate tanks and condensate piping.

- b. Gray:Heating, ventilating, air conditioning and refrigeration equipment (except as required to match surrounding surfaces), and water and sewage treatment equipment and sewage ejection equipment.
 - c. Aluminum Color:. Ferrous metal on outside of boilers and in connection with boiler settings including supporting doors and door frames and fuel oil burning equipment, and steam generation system (bare piping, fittings, hangers, supports, valves, traps and miscellaneous iron work in contact with pipe).
 - d. Federal Safety Red: Exposed fire protection piping hydrants, post indicators, electrical conducts containing fire alarm control wiring, and fire alarm equipment.
 - e. Federal Safety Orange: Entire lengths of electrical conduits containing feeders 600 volts or more. Use Glid-Guard #4510 or approved equal acceptable to the COTR.
 - f. Color to match brickwork sheet metal covering on breeching outside of exterior wall of boiler house.
- I. Apply paint systems on properly prepared and primed surface as follows:
- 1. Interior Locations:
 - a. Apply two coats of MPI 47 (Interior Alkyd, Semi-Gloss (AK)) to following items:
 - 1) Metal under 94 degrees C (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. Ferrous metal exposed in hydrotherapy equipment room and chlorinator room of water and sewerage treatment plants: One coat of MPI 101 (Cold Curing Epoxy Primer) and one coat of MPI 98 (High Build Epoxy Coating)).

- c. Apply one coat of MPI 50 (Interior Latex Primer Sealer) and one coat of MPI 53 (Interior Latex, Flat, MPI Gloss Level 1 (LE)) on finish of insulation on boiler breeching and uptakes inside boiler house, drums, drumheads, oil heaters, feed water heaters, tanks and piping.
 - d. Apply two coats of MPI 22 (High Heat Resistant Coating (HR)) to ferrous metal surface over 94 degrees K (200 degrees F) of following items:
 - 1) Garbage and trash incinerator.
 - 2) Medical waste incinerator.
 - 3) Exterior of boilers and ferrous metal in connection with boiler settings including supporting members, doors and door frames and fuel oil burning equipment.
 - 4) Steam line flanges, bare pipe, fittings, valves, hangers and supports over 94 degrees K (200 degrees F).
 - 5) Engine generator exhaust piping and muffler.
 - e. Paint electrical conduits containing cables rated 600 volts or more using two coats of MPI 9 (Exterior Alkyd Enamel (EO)) in the Federal Safety Orange color in exposed and concealed spaces full length of conduit.
3. Other exposed locations:
- a. Metal surfaces, except aluminum, of cooling towers exposed to view, including connected pipes, rails, and ladders: Two coats of MPI 1 (Aluminum Paint (AP)).
 - b. 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 one coat of MPI 119 (Exterior Latex, High Gloss (acrylic) (AE)).
- J. Legends:
- For electrical Conduits and pull boxes containing feeders over 600 volts, paint legends using 50 mm (2 inch) high black numbers and letters, showing the voltage class rating. For conduit, provide legends where conduits pass through walls and floors and at maximum 6100 mm (20 foot) intervals in between. Use labels with yellow background with black border and the words **Danger High Voltage Class, 15000-volts**. For pull boxes, provide a

legend on the front cover. Use labels the same size as for conduit with the words **Danger High Voltage - Keep Out.**

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/or existing work including colors and gloss of finish selected is specified in finish schedule.
 - 2. Painting of disturbed, damaged and repaired or patched surfaces when entire space is not scheduled for complete repainting or refinishing.
 - 3. Painting of ferrous metal and galvanized metal.
 - 4. Painting of wood with fire retardant paint exposed in attics, when used as mechanical equipment space except shingles.
 - 5. Identity painting and safety painting.
- B. Building and Structural Work not Painted:
 - 1. Pre-finished items:
 - a. Casework, doors, elevator entrances and cabs, metal panels, wall covering, and similar items specified factory finished under other sections.
 - b. Factory finished equipment and pre-engineered metal building components such as metal roof and wall panels.
 - 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 dumbwaiter, elevator and duct shafts, interstitial spaces, pipe basements, crawl spaces, pipe tunnels, above ceilings, attics, except as otherwise specified. Gypsum board walls must have primer sealer applied to them.
 - b. Inside walls or other spaces behind access doors or panels.
 - c. Surfaces concealed behind permanently installed casework and equipment. However, primer sealer must be applied to these surfaces prior to installation of casework.

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. Galvanized metal:
 - a. Gas Storage Racks.
 - b. Except where specifically specified to be painted.
8. Gaskets.
9. Concrete curbs, gutters, pavements, retaining walls, exterior exposed foundations walls and interior walls in pipe basements.
10. Structural steel encased in concrete, masonry, or other enclosure.
11. Structural steel to receive sprayed-on fire proofing.
12. Ceilings, walls, columns in interstitial spaces.
13. Ceilings, walls, and columns in pipe basements.

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 3,048 mm (10 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.

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

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 - 414 kPa (60 psig) and above.
- b. Medium Pressure - 104 to 413 Kpa (15 to 59 psig).
- c. Low Pressure - 103 kPa (14 psig) and below.
- 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 BBREVIATIONS
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				

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

Hot Water Heating Supply Htg Sup		Yellow	Black	H. W.
Hot Water Heating Return Htg Ret		Yellow	Black	H. W.
Gravity Condensate Return Ret		Yellow	Black	Gravity Cond
Pumped Condensate Return Cond Ret		Yellow	Black	Pumped
Vacuum Condensate Return Ret		Yellow	Black	Vac Cond
Fuel Oil - Grade		Green	White	Fuel Oil-Grade __*
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 Re-circulating		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				

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

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 51 mm (2 inch) high black numbers and letters, showing the voltage class rating. Provide legends where conduits pass through walls and floors and at maximum 3,048 mm (10 foot) intervals in between. Use labels with yellow background with black border and words Danger High Voltage Class, 15000-volts.

8. See Sections for methods of identification, legends, and abbreviations of the following:
- a. Laboratory gas and vacuum lines: Section 22 62 00, VACUUM SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES; section 22 63 00, GAS SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES.
 - b. Medical Gases and vacuum lines: Section 22 62 00, VACUUM SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES; section 22 63 00, GAS SYSTEMS FOR LABORATORY AND HEALTHCARE FACILITIES.

B. Fire and Smoke Partitions:

- 1. Identify partitions above ceilings on both sides of partitions except within shafts in letters not less than 64 mm (2 1/2 inches) high.
- 2. Stenciled message: "SMOKE PARTITION" or, "FIRE PARTITION" as applicable.
- 3. Locate not more than 3,048 mm (10 feet) on center on corridor sides and room sides of partitions, and with a least one message per room on room side of partition.

4. Use semi-gloss paint of color that contrasts with color of substrate.
- C. Identify columns in pipe basements and interstitial space:
 1. Apply stenciled number and letters to correspond with grid numbering and lettering shown.
 2. Paint numbers and letters 102 mm (4 inches) high, locate 457 mm (18 inches) below overhead structural slab.
 3. Apply on four sides of interior columns and on inside face only of exterior wall columns.
 4. Color:
 - a. Use black on concrete columns.
 - b. Use white or contrasting color on steel columns.

3.14 PROTECTION CLEAN UP, AND TOUCH-UP

- A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.
- B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted 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 - - -

APPENDIX

Coordinate the following abbreviations used in SECTION 09900/09900R, PAINTING, with other Sections, especially 09050, INTERIOR EXTERIOR FINISHES, MATERIALS AND FINISH SCHEDULES, 09050R, COLOR DESIGN, and other COATING SECTIONS listed. Use the same abbreviation and terms consistently.

Paint or coating Abbreviation

Acrylic Emulsion AE (MPI 10 - flat/MPI 11 - semi-gloss/MPI 119 - gloss)

Alkyd Flat Ak (MPI 49)

Alkyd Gloss Enamel G (MPI 48)

Alkyd Semi-gloss Enamel SG (MPI 47)

Aluminum Paint AP (MPI 1)

Cementitious Paint CEP (TT-P-1411)

Exterior Latex EL??(MPI 10 / 11 / 119)??

Exterior Oil EO (MPI 9 - gloss/MPI 8 - flat/MPI 94 - semi-gloss)

Epoxy Coating EC (MPI 77 - walls, floors/MPI 108 - CMU, concrete)

Fire Retardant Paint FR (MPI 67)

Fire Retardant Coating (Clear) FC (MPI 66, intumescent type)

Floor Enamel FE (MPI 27 - gloss/MPI 59 - eggshell)

Heat Resistant Paint HR (MPI 22)

Latex Emulsion LE (MPI 53, flat/MPI 52, eggshell/MPI 54, semi-gloss/MPI 114, gloss)

Latex Flat LF (MPI 138)

Latex Gloss LG (MPI 114)

Latex Semi-gloss SG (MPI 141)

Latex Low Luster LL (MPI 139)

Plastic Floor Coating PL

Polyurethane Varnish PV (MPI 31 - gloss/MPI 71 - flat)

Rubber Paint RF (CID-A-A-3120 - Paint for Swimming Pools (RF)).

Water Paint, Cement WPC (CID-A-A-1555 - Water Paint, Powder).

Wood Stain WS (MPI 90)

Verify abbreviations used in the following coating Sections and new sections developed in MASTERFORMAT Section 09800 series for conflicts with other abbreviations used for materials and finishes.

Section 09815, HIGH BUILD GLAZED COATING GC

TRUEBEAM STX SITE PREP PROJECT
JAMES A. HALEY VETERANS' HOSPITAL

Section 09836, MULTI COLOR COATING

MC

- - - E N D - - -

SECTION 10 14 00
SIGNAGE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies interior signage for rooms and code required signs.
- B. Refer to drawings for sign types & details, coordinate with Medical Center for all sign text, colors, room numbers, and any special requirements.
- C. Provide new permanent room signage for all spaces identified in Room Finish Schedule, along with remove & replace all existing permanent room signage within the Area of Renovation, including all rooms opening into the area of renovation.
- D. Coordinate interior signage with current VA Signage Design Guide.
- E. Provide all signs to meet ADA guidelines.

1.2 RELATED WORK

- A. 01 58 16: Temporary Interior Signage

1.3 MANUFACTURER'S QUALIFICATIONS

Sign manufacturer shall provide evidence that they regularly and presently manufacturers signs similar to those specified in this section as one of their principal products.

1.4 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Samples: Sign panels and frames, with letters and symbols, each type. Submit 2 sets. One set of samples will be retained by Resident Engineer, other returned to Contractor.
 - 1. Sign Panel, 200 mm x 250 mm (8 inches x 10 inches), with letters.
 - 2. Color samples of each color, 150 mm x 150 mm (6 inches x 6 inches). Show anticipated range of color and texture.
 - 3. Sample of typeface, arrow and symbols in a typical full size layout.
- C. Manufacturer's Literature:
 - 1. Showing the methods and procedures proposed for the concealed anchorage of the signage system to each surface type.

2. Manufacturer's printed specifications, anchorage details, installation and maintenance instructions.

- D. Samples: Sign location plan, showing location, type and total number of signs required.
- E. Shop Drawings: Scaled for manufacture and fabrication of sign types. Identify materials, show joints, welds, anchorage, accessory items, mounting and finishes.

1.5 DELIVERY AND STORAGE

- A. Deliver materials to job in manufacturer's original sealed containers with brand name marked thereon. Protect materials from damage.
- B. Package to prevent damage or deterioration during shipment, handling, storage and installation. Maintain protective covering in place and in good repair until removal is necessary.
- C. Deliver signs only when the site and mounting services are ready for installation work to proceed.
- D. Store products in dry condition inside enclosed facilities.

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):
 - B209-07.....Aluminum and Aluminum-Alloy Sheet and Plate
 - B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and tubes.
- C. Federal Specifications (Fed Spec):
 - MIL-PRF-8184F.....Plastic Sheet, Acrylic, Modified.
 - MIL-P-46144C.....Plastic Sheet, Polycarbonate

1.7 MINIMUM SIGN REQUIREMENTS

- A. Permanent Rooms and Spaces:
 - 1. Tactile and Braille Characters, raised minimum 0.793 mm (1/32 in). Characters shall be accompanied by Grade 2 Braille.
 - 2. Type Styles: Characters shall be uppercase, Helvetica Medium, Helvetica Medium Condensed and Helvetica Regular.
 - 3. Character Height: Minimum 16 mm (5/8 in) high, Maximum 50 mm (2 in).

4. Symbols (Pictograms): Equivalent written description shall be placed directly below symbol, outside of symbol's background field. Border dimensions of symbol background shall be minimum 150 mm (6 in) high.
5. Finish and Contrast: Characters and background shall be eggshell, matte or other non-glare finish with adequate contrast with background.
6. Mounting Location and Height: As shown. Mounted on wall adjacent to the latch side of the door and to avoid door swing and protruding objects.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Signs of type, size and design shown on the drawings and as specified.
- B. Signs complete with lettering, framing and related components for a complete installation.
- C. Provide graphics items as completed units produced by a single manufacturer, including necessary mounting accessories, fittings and fastenings.
- D. Do not scale drawings for dimensions. Contractor to verify and be responsible for all dimensions and conditions shown by these drawings. Resident Engineer to be notified of any discrepancy in drawing, in field directions or conditions, and/or of any changes required for all such construction details.
- E. The Sign Contractor, by commencing work of this section, assumes overall responsibility, as part of his warranty of work, to assure that assemblies, components and parts shown or required within the work of the section, comply with the Contract Documents. The Contractor shall further warrant: That all components, specified or required to satisfactorily complete the installation are compatible with each other and with conditions of installations.

2.2 PRODUCTS

- A. Aluminum:
 1. Sheet and Plate: ASTM B209.
 2. Extrusions and Tubing: ASTM B221.

- B. Cast Acrylic Sheet: MIL-PRF-8184F; Type II, class 1, Water white non-glare optically clear. Matt finish water white clear acrylic shall not be acceptable.
- C. Polycarbonate: MIL-P-46144C; Type I, class 1.
- D. Vinyl: 0.1 mm thick machine cut, having a pressure sensitive adhesive and integral colors.

2.3 SIGN STANDARDS

- A. Topography:
 - 1. Type Style: Helvetica Medium and Helvetica Medium Condensed. Initial caps or all caps as indicated in Sign Message Schedule.
 - 2. Arrow: See graphic standards in drawings.
 - 3. Letter spacing: See graphic standards on drawings.
 - 4. All text, arrows, and symbols to be provided in size, colors, typefaces and letter spacing shown. Text shall be a true, clean, accurate reproduction of typeface(s) shown. Coordinate final text copy with VA.

2.4 SIGN TYPES

- A. Refer to drawings.
 - 1. The interior sign system is comprised of sign types families that are identified by a letter and number which identify a particular group of signs. An additional number identifies a specific type of sign within that family.
 - a. IN indicates a component construction based sign.
 - 2. The exterior sign system shall be comprised of sign types families that are identified by a letter and number which identify a particular group of signs. An additional number identifies a specific type of sign within that family.
 - a. EI designation indicates exterior internally illuminated sign.
 - b. EN designation indicates exterior non-illuminated sign.
- B. Interchangeable Component System:
 - 1. Sign Type Families used: 03, 04, 06, and 07.
 - 2. Interior sign system capable of being arranged in a variety of configurations with a minimum of attachments, devices and connectors.

- a. Interchangeable nature of the system shall allow for changes of graphic components of the installed sign, without changing sign in its entirety.
 - b. Component Sign System is comprised of the following primary components:
 - 1) Rail Back utilizing horizontal rails, spaced to allow for uniform, modular sizing of sign types.
 - 2) Rail Insert mounted to back of Copy Panels to allow for attachment to Rail Back.
 - 3) Copy Panels, made of a variety of materials to allow for different graphic needs.
 - 4) End Caps which interlock to Rail Back to enclose and secure changeable Copy Panels.
 - 5) Joiners and Accent Joiners connect separate Rail Backs together.
 - 6) Top Accent Bars which provide decorative trim cap that encloses the top of sign or can connect the sign to a Type 03 Room Number Sign.
 - c. Rail Back, Rail Insert and End Caps in anodized extruded aluminum to allow for tight tolerances and consistent quality of fit and finish.
 - d. Signs in system shall be convertible in the field to allow for enlargement from one size to another in height and width through use of Joiners or Accent Joiners, which connect Rail Back panels together blindly, providing a butt joint between Copy Panels. Accent Joiners shall connect Rail Backs together with a visible 3 mm (1/8") horizontal rib, flush to the adjacent copy insert surfaces.
 - e. Sign configurations shall vary in width from 225 mm (9 inches) to 2050 mm (80 inches), and have height dimensions of 50 mm (2 inches), 75 mm (3 inches), 150 mm (6 inches), 225 mm (9 inches) and 300 mm (12 inches). Height shall be increased beyond 300 mm (12 inches), by repeating height module in full or in part.
3. Rail Back functions as internal structural member of sign using 6063T5 extruded aluminum and anodized black.

- a. Shall accept an extruded aluminum or plastic insert on one sign or on both sides, depending upon sign type.
 - b. Shall be convertible in field to allow for connection to other Rail Back panels, so that additive changes can be made to sign unit.
 - c. Rail shall allow for a variety of mounting devices including wall mounting for screw-on applications, using pressure sensitive tape, freestanding mount, ceiling mount and other mounting devices as needed.
4. Rail Insert functions as a mounting device for Copy Panels on to the Rail Back. The Rail Insert mounts to the back of the Copy Panel with adhesive suitable for use with the particular copy insert material.
- a. Shall allow Copy Panels to slide or snap into the horizontal Rail Back for ease of changeability.
 - b. Shall mount to the back of the Copy Panel with adhesive suitable for use with particular Copy Panel material.
5. Copy Panels shall accept various forms of copy and graphics, and attaches to the Rail Back with the Rail Insert. Copy Panels shall be either ABS plastic with integral color or an acrylic lacquer finish; photo polymer; or, acrylic.
- a. Interchangeable by sliding horizontally from either side of sign, and to other signs in system of equal or greater width or height.
 - b. Cleanable without use of special chemicals or cleaning solutions.
 - c. Copy Insert Materials.
 - 1) ABS Inserts - 2.3 mm (.090 inches) extruded ABS plastic core with .07 mm (.003 inches) acrylic cap bonded during extrusion/texturing process. Pressure bonded to extruded Rail Insert using adhesive. Background color is either integral or painted in acrylic lacquer. ABS inserts finished in a chromium industries #HM335RA texture pattern to prevent glare.
 - 2) Photo polymer Inserts - 3 mm (.125 inches) phenolic photo polymer with raised copy etched to 2.3 mm (.0937 inches), bonded to an ABS plastic or extruded aluminum insert with adhesive. Background color is painted in acrylic enamel.

- 3) Changeable Paper/ Insert Holder - Extruded insert holder with integral Rail Insert for connection with structural back panel in 6063T5 aluminum with a black anodized finish. Inserts into holder are paper with a clear 0.7 mm (.030 inches) textured cover. Background color is painted in acrylic lacquer.
- 4) Acrylic - 2 mm (.080 inches) non-glare acrylic. Pressure bonded to extruded Rail Insert using adhesive. Background color is painted in acrylic lacquer or acrylic enamel.
- 5) Extruded 6063T5 aluminum with a black anodized finish Insert Holder with integral Rail Insert for connection with Structural Back Panel to hold a 0.7 mm (.030 inches) textured polycarbonate insert and a Sliding Tile which mounts in the Inset Holder and slides horizontally.
- 6) End Caps - Extruded using 6063T5 aluminum with a black anodized. End Caps interlock with Rail Back with clips to form an integral unit, enclosing and securing the changeable Copy Panels, without requiring tools for assembly.
 - a) Shall be interchangeable to either end of sign and to other signs in the system of equal height.
 - b) Mechanical fasteners can be added to the End Caps that will secure it to Rail Back to make sign tamper resistant.
- 7) Joiners - Extruded using 6063T5 aluminum with a black anodized finish. Rail Joiners connect Rail Backs together blindly, providing a butt joint between Copy Inserts.
- 8) Accent Joiners - Extruded using 6063T5 aluminum with a mirror polished finish. Joiner shall connect Rail Backs together with a visible 3 mm (.125 inches) horizontal rib, flush to the adjacent Copy Panel surfaces.
- 9) Top Accent Rail - Extruded using 6063T5 aluminum with a mirror polished finish. Rail shall provide 3 mm (.125 inches) high decorative trim cap, which butts flush to adjacent Copy Panel and encloses top of Rail Back and Copy Panel.
- 10) Typography
 - a) Vinyl First Surface Copy (non-tactile) - Applied Vinyl copy.

- b) Subsurface Copy Inserts - Textured 1 mm (.039 inches) clear polycarbonate face with subsurface applied Vinyl copy. Face shall be back sprayed with paint and laminated to an extruded aluminum carrier insert.
- c) Integral Tactile Copy Inserts - phenolic photo polymer etched with 2.3 mm (.0937 inches) raised copy.
- d) Silk-screened First Surface Copy (non-tactile) - Injection molded or extruded ABS plastic or aluminum insert with first surface applied enamel silk-screened copy.

C. Sign Type Families 02: Not used

D. Sign Type Families 03:

- 1. Tactile sign is to be made from a material that provides for letters, numbers and Braille to be integral with sign plaque material such as: photosensitive polyamide resin, etched metal, sandblasted phenolic or embossed material. Do not apply letters, numbers and Braille with adhesive.
- 2. Numbers, letters and Braille to be raised 0.793 mm (.0312 inches) from the background surface. The draft of the letters, numbers and Braille to be tapered, vertical and clean.
- 3. Braille dots are to conform with standard dimensions for literary Braille; (a) Dot base diameter: 1.5 mm (.059 inches) (b) Inter-dot spacing: 2.3 mm (.090 inches) (c) Horizontal separation between cells: 6.0 mm (.241 inches) (d) Vertical separation between cells: 10.0 mm (.395 inches)
- 4. Entire assembly is painted in specified color. After painting, apply white or other specified color to surface of the numbers and letters. Entire sign is to have a protective clear coat sealant applied.
- 5. Complete sign is to have an eggshell finish (11 to 19 degree on a 60 degree glossmeter).

E. Sign Type Family 04:

- 1. All text and graphics are to be first surface applied vinyl letters.
- 2. IN-04: When a Type IN-04 is to be mounted under a Type IN03, a connecting Accent Joiner is to be used to create a singular integrated sign.

F. Sign Type 05: Not Used

G. Sign Type Family 06 and 07:

1. All text and graphics are to be first surface applied vinyl letters except for under sliding tile.
2. Protect text, which is covered by sliding tile, so tile does not wear away letters.

2.5 FABRICATION

- A. Design components to allow for expansion and contraction for a minimum material temperature range of 56 °C (100 °F), without causing buckling, excessive opening of joints or over stressing of adhesives, welds and fasteners.
- B. Form work to required shapes and sizes, with true curve lines and angles. Provide necessary rebates, lugs and brackets for assembly of units. Use concealed fasteners whenever and wherever possible.
- C. Shop fabricate so far as practicable. Joints fastened flush to conceal reinforcement, or welded where thickness or section permits.
- D. Contact surfaces of connected members be true. Assembled so joints will be tight and practically unnoticeable, without use of filling compound.
- E. Signs shall have fine, even texture and be flat and sound. Lines and miters sharp, arises unbroken, profiles accurate and ornament true to pattern. Plane surfaces be smooth flat and without oil-canning, free of rack and twist. Maximum variation from plane of surface plus or minus 0.3 mm (0.015 inches). Restore texture to filed or cut areas.
- F. Level or straighten wrought work. Members shall have sharp lines and angles and smooth surfaces.
- G. Extruded members to be free from extrusion marks. Square turns and corners sharp, curves true.
- H. Drill holes for bolts and screws. Conceal fastenings where possible. Exposed ends and edges mill smooth, with corners slightly rounded. Form joints exposed to weather to exclude water.
- I. Finish hollow signs with matching material on all faces, tops, bottoms and ends. Edge joints tightly mitered to give appearance of solid material.
- J. All painted surfaces properly primed. Finish coating of paint to have complete coverage with no light or thin applications allowing substrate or primer to show. Finished surface smooth, free of scratches, gouges,

drips, bubbles, thickness variations, foreign matter and other imperfections.

- K. Movable parts, including hardware, are to be cleaned and adjusted to operate as designed without binding or deformation of members. Doors and covers centered in opening or frame. All contact surfaces fit tight and even without forcing or warping components.
- L. Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.
- M. No signs are to be manufactured until final sign message schedule and location review has been completed by the Resident Engineer & forwarded to contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Protect products against damage during field handling and installation. Protect adjacent existing and newly placed construction, landscaping and finishes as necessary to prevent damage during installation. Paint and touch up any exposed fasteners and connecting hardware to match color and finish of surrounding surface.
- B. Mount signs in proper alignment, level and plumb according to the sign location plan and the dimensions given on elevation and sign location drawings. Where otherwise not dimensioned, signs shall be installed where best suited to provide a consistent appearance throughout the project. When exact position, angle, height or location is in doubt, contact Resident Engineer for clarification.
- C. Contractor shall be responsible for all signs that are damaged, lost or stolen while materials are on the job site and up until the completion and final acceptance of the job.
- D. Remove or correct signs or installation work Resident Engineer determines as unsafe or as an unsafe condition.
- E. At completion of sign installation, clean exposed sign surfaces. Clean and repair any adjoining surfaces and landscaping that became soiled or damaged as a result of installation of signs.

- F. Locate signs as shown on the approved, GC provided Sign Location Plan.
- G. Certain signs may be installed on glass. A blank glass back up is required to be placed on opposite side of glass exactly behind sign being installed. This blank glass back up is to be the same size as sign being installed.
- H. Contractor will be responsible for verifying that behind each sign location there are no utility lines that will be affected by installation of signs. Any damage during installation of signs to utilities will be the sole responsibility of the Contractor to correct and repair.
- I. Furnish inserts and anchoring devices which must be set in concrete or other material for installation of signs. Provide setting drawings, templates, instructions and directions for installation of anchorage devices which may involve other trades.

- - - END - - -

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 10 21 23
CUBICLE CURTAIN AND TRACKS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies curtains and tracks assembly.
- B. Refer to drawings for locations.

1.2 RELATED WORK

- A. Steel shapes for suspending track assembly: 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. Samples:
 - One 300 mm (12 inch) long piece of cubicle curtain track with carrier access and end stop.
- C. Shop Drawings: Showing layout of tracks and method of anchorage.
- D. Manufacturer's Literature and Data:
 - Cubicle curtain track and curtain

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver material in original package marked to identify the contents, brand name, and the name of the manufacturer or supplier.
- B. Store in dry and protected location. Store so as to not bend or warp the tracks.
- C. Do not open packages until contents are needed for installation, unless verification inspection is required.

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 for Testing and Materials (ASTM):
 - B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
 - B456-03.....Electrodeposited Coatings for Copper Plus Nickel Plus Chromium and Nickel Plus Chromium
- C. The National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500-06.....Metal Finishes Manual

PART 2 - PRODUCTS

2.1 CUBICLE CURTAIN TRACKS

- A. Surface mounted, suspended type:
 - 1. Channel Tracks (Surface Mounted Type): Extruded aluminum, ASTM B221, alloy 6063, temper T5 or T6, channel shaped, with smooth inside raceway for curtain carriers.
- B. Curtain Carriers: Nylon or delrin carriers, with either nylon or delrin wheels on metal, delrin, or nylon axles. Equip each carrier with either stainless steel, chromium plated brass or steel hooks with swivel, or nickel chromium plated brass or stainless steel bead chain and hook assembly, or delrin carriers may have moulded on delrin hooks. Hook for bead chain may be the same material and finish as the bead chain or may be chromium plated steel. Provide 2.2 carriers for every 300 mm (one foot) of each section of each track length, plus one additional carrier.
- C. End Stop Connectors, Ceiling Flanges and Other Accessories: Fabricate from the same material with the same finish as the tracks or from nylon.
- D. Hangers and Fittings: Fabricate from the same material with the same finish as the tracks. Hangers may be round or square for channel tracks and round for tubular tracks. Design fittings to be compatible with design of tracks and to safely transmit the track load to the hangers.
- E. At end of each section of track, make provision for insertion and removal of carriers. Design to prevent accidental removal of carrier. Any operating mechanism shall be removable with common tools.

2.2 CURTAINS

- A. Made with inherent fire retardant material that is durable, safe, and lasts throughout the lifetime of the cubicle curtain.
- B. The top FR nylon mesh with ½" opening woven - color as indicated in drawings, snag free header, combined with #2 grommet.
- C. Curtain to have mesh top to allow for air movement.
- D. Size of curtain shall be from ceiling to 14" above the finish floor.
- E. Curtain material: Refer to drawings.

2.3 FASTENERS

- A. Exposed Fasteners, Screws and Bolts: Stainless steel or chromium/nickel plated brass.

- B. Concealed Fasteners, Screws and Bolts: Hot-dip galvanized (except in high moisture areas use stainless steel).
- C. Metal Clips: Anchor curtain tracks to exposed grid of lay-in acoustical tile ceilings, with concealed metal (butterfly) type or two piece snap locking type ceiling clip of high strength spring steel. When it is not possible to install the metal ceiling clip, the cubicle curtain track may be screwed to the ceiling grid.

2.4 FINISHES

- A. Aluminum: Finish numbers for aluminum specified are in accordance with The Aluminum Association's Designation System. AA-C22A31 finish Chemically etched medium matte, with clear anodic coating, Class II Architectural, 0.4 mils thick .

2.5 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form tracks and bends of lengths that will produce the minimum number of joints. Make track sections up to 4800 mm (16 feet) without joints. Form corner bend on a 300 mm (12 inch) radius.
- C. Provide steel anchor plates, supports, and anchors for securing components to building construction.
- D. Form flat surface without distortion.
- E. Shop assemble components and package complete with anchors and fittings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install tracks after finish painting and ceiling finishing operations are complete.
- B. Install track level and hangers plumb and securely anchor to the ceiling or suspend from above to form a rigid installation.
- C. Anchor surface mounted curtain tracks directly to exposed grid of lay-in acoustical tile ceilings with suitable fasteners, spaced approximately 600 mm (24 inches) on center.
- D. Anchor surface mounted curtain tracks to concrete, plaster and gypsum board ceilings with a minimum of 3 mm (1/8-inch) diameter fastenings or concealed clips spaced not more than 900 mm (three feet) on center.

- E. Install suspended track seven feet, three inches above the finished floor, with hangers spaced no more than four feet on center. At ceiling line, provide flange fittings secured to hangers with set screws. Secure track to walls with flanged fittings and to hangers with special fittings.
- F. Securely fasten end stop caps to prevent their being forced out by the striking weight of carriers.
- G. Anchor surface mounted intravenous track directly to support system above ceiling as shown.
- H. Remove damaged or defective components and replace with new components or repair to the original condition.

3.2 ACCEPTANCE

- A. Track shall be installed neat, rigid, plumb, level and true, and securely anchored to the overhead construction.
- B. Carrier units shall operate smoothly and easily over the full range of travel.

- - - E N D - - -

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), wall guards, corner guards, door protection and high impact wall covering.
- B. Coordinate with VA Project Manager for type required.
- C. Refer to drawings for additional information.

1.2 RELATED WORK

- A. Armor plates and kick plates not specified in this section: Section 08 71 00, DOOR HARDWARE.

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. Wall Guards.
 - 2. Corner Guards.
 - 3. Door Protectors.
 - 4. High Impact Wall covering
- 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 21° C (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(R2004).....Stainless and Heat-Resisting Chromium-Nickel
Steel Plate, Sheet, and Strip
- B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods,
Wire, Shapes, and Tubes
- D256-06ae1.....Impact Resistance of Plastics
- D635-06.....Rate of Burning and/or Extent and Time of
Burning of Self-Supporting Plastics in a
Horizontal Position
- E84-08a.....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):

- 80-07.....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 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 1197 ps (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, 48" tall mounted above wall base, Equal to SM-20 Series by C/S Group: Surface mounted type of 30 mm (1/4 inch radius), 6 mm 1/4-inch corner) formed to profile shown.
 - 1. Snap-on corner guard formed from resilient material, minimum 2 mm (0.078-inch) thick, free floating on a continuous 1.6 mm (0.063-inch) thick extruded aluminum retainer. Design retainer used for flush mounted type to act as a stop for adjacent wall finish material. 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.
 - 3. Flush mounted corner guards installed on any fire rated wall shall maintain the fire rating of the wall. Provide fire test of proposed corner guard system to verify compliance.
 - a. Where insulating materials are an integral part of the corner guard system, the insulating materials shall be provided by the manufacturer of the corner guard system.
 - b. All exposed metal in fire rated assemblies shall have a paintable finish.

2.3 WALL GUARDS

- A. Resilient Wall Guards:
 - 1. Wall Guards (Crash Rails) equal to SCR-64E series by C/S Group with covers of resilient material, minimum 2.8 mm (0.110-inch) thick, shall be free-floated over 50 mm (two-inch) wide aluminum retainer clips, minimum 2.3 mm (0.090-inch) thick, anchored to wall at maximum

600 mm (24 inches) on center, supporting a continuous aluminum retainer, minimum 1.6 mm (0.062-inch) thick; or, shall be free-floated over a continuous extruded aluminum retainer, minimum 2.3 (0.090-inch) thick anchored to wall at maximum 600 mm (24 inches) on center.

3. Provide wall guards (crash rails) with prefabricated end 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 wall guards (crash rails). Screw or bolt closure caps to aluminum retainer.

2.4 DOOR PROTECTION

- A. Equal to Door Protection Model SS-DP by C/S Group: Material shall be supplied precut with de-burred edges. Height to be 34" high at single doors and 44" high at double doors.
- B. Field install using manufacturer's recommended water based contact cement.
- C. Coordinate door protection material requirements with door and frame suppliers to insure fit for all components, and color as specified.

2.5 HIGH IMPACT WALL COVERING

- A. Equal to 0.060" thick high impact Acrovyn vinyl acrylic wallcovering by C/S Group designed specially for interior use. Install 48" AFF above wall base material behind every Patient bed and spanning between the vertical head wall units.
- B. Coordinate with door guard rail protection material and supplier for proper fit, installation and color.
- C. Provide all wainscot trims and "H" joint moldings
- D. Provide adhesive as recommended by the wall covering manufacturer.

2.6 FASTENERS AND ANCHORS

- A. Provide fasteners and anchors as required for each specific type of installation.
- B. Where type, size, spacing or method of fastening is not shown or specified, submit shop drawings showing proposed installation details.

2.7 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. Stainless Steel: NAAMM finish Number 4.

D. Resilient Material: refer to drawings.

PART 3 - INSTALLATION

3.1 RESILIENT CORNER GUARDS

- A. Install corner guards on walls in accordance with manufacturer's instructions.

3.2 STAINLESS STEEL WALL GUARDS

- A. Mount guards on external corners of interior walls, partitions and columns as shown.
- B. Where corner guards are installed on walls, partitions or columns finished with plaster or ceramic tile, anchor corner guards as shown on drawings. Provide continuous 16 gage perforated, galvanized Z-shape steel anchors welded to back edges of corner guards and wired to metal studs, expansion bolted to concrete or masonry with four 9.5 mm (3/8-inch) diameter bolts, spaced 400 mm (16 inches) on centers. Coat back surfaces of corner guards, where shown, with a non-flammable, sound deadening material. Corner guards shall overlap finish plaster surfaces.
1. Where corner guards are installed on exposed structural glazed facing tile units or masonry wall, partitions or columns, anchor corner guards as shown on the drawings , or anchor corner guards to existing walls with 6 mm (1/4-inch) oval head stainless steel countersunk expansion or toggle bolts , or anchor corner guards with four nominal 1.3 mm (0.0516-inch) thick, adjustable galvanized steel anchors, spaced as shown. Grout spaces solid between guards and backing with Portland cement and sand mortar.
 2. Where corner guards are installed on gypsum board, clean surface and anchor guards with a neoprene solvent-type contact adhesive specifically manufactured for use on gypsum board construction.

Remove excess adhesive from around edge of guard and allow to cure undisturbed for 24 hours.

3.3 RESILIENT WALL GUARDS (CRASH RAIL)

Secure guards to walls with mounting cushions brackets and fasteners in accordance with manufacturer's details and instructions.

3.4 STAINLESS STEEL WALL GUARDS

Space brackets at not more than three feet on centers and anchor to the wall in accordance with manufacturer's installation instructions.

3.5 DOOR PROTECTION AND HIGH IMPACT WALL COVERING

- A. Surfaces to receive protection shall be clean, smooth and free of obstructions.
- B. Install protectors after frames are in place but preceding installation of doors in accordance with approved shop drawings and manufacturers specific instructions.
- C. Apply with adhesive in controlled environment according to manufacture's recommendations.
- D. Protection installed on fire rated doors and frames shall be installed according to NFPA 80 and installation procedures listed in UL Building Materials Directory; or, equal listing by other approved independent testing laboratory establishing the procedures.

- - - E N D - - -

SECTION 12 32 00
MANUFACTURED WOOD CASEWORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies plastic laminate casework as detailed on the 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 as follows:
 - 1. Cabinets and counters

1.2 RELATED WORK

- A. Custom Casework: Section 06 20 00, FINISH CARPENTRY.
- B. Color and Finish of Plastic Laminate: Section 09 06 00, SCHEDULE FOR FINISHES.
- C. Lavatories and Plumbing in Casework: Section 22 40 00, PLUMBING FIXTURES.

1.3 MANUFACTURER'S QUALIFICATIONS

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:
 - Sinks, trim and fittings.
 - Locks for doors and drawers
 - Adhesive cements
- C. Samples:
 - Counter top, plastic laminate, 150 mm (six inch) square
 - Wood Face Veneer or Hardwood Plywood
- 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.

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. Composite Panel Association (CPA):
- A208.1-09.....Particleboard
- D. U.S. Department of Commerce Product Standards (Prod. Std):
- PS1-95.....Construction and Industrial Plywood
- E. Hardwood, Plywood and Veneer Association (HPVA):
- HP-1-09.....Hardwood and Decorative Plywood
- F. Architectural Woodwork Institute (AWI):
- Architectural Woodwork Quality Standards, Guide Specifications Quality
Certification Program - 1999
- G. American Society of Mechanical Engineers (ASME):
- A112.18.1-05.....Plumbing Fixture Fittings
- H. 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 or particle board.
 - 2. Resin impregnated decorative paper thermally fused to particle board.
- D. Backing sheet on bottom of plastic laminate covered wood tops. Backer Type BKL.
- E. Post Forming Fabrication, Decorative Surface: Post forming Type HGP.

2.3 PLYWOOD, SOFTWOOD

Prod. Std. PS1, five ply construction from 13 mm to 28 mm (1/2 inch to 1-1/8 inch) thickness, and seven ply for 31 mm (1 1/4 inch) thickness.

2.4 PARTICLEBOARD

CPA A208.1, Type 1, Grade 1-M-3.

2.5 RUBBER OR VINYL BASE

Straight (for carpet), cove (for resilient floor); 100 mm (4 inch) high, 3 mm (1/8 inch) thick, flexible to conform to irregularities in walls, partitions and floors.

2.6 PLUMBING FIXTURES

ASME A112.18.1, except die-cast zinc-alloy material is not acceptable.

2.7 HARDWARE

- A. Where pin tumbler locks are specified, disc tumbler lock "Duo A", with brass working parts and case, as manufactured by the Illinois Lock Company will be an acceptable substitute. 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 two 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 900 mm (36 inches) and more in height shall have three hinges and doors less than 900 mm (36 inches) in height shall have two hinges. Each door shall close against two rubber bumpers.
2. Hinges: Fabricate hinges with minimum 2 mm (0.072 inch) thick chromium plated steel leaves, and with minimum 3.5 mm (0.139 inch) diameter stainless steel pin. Hinges shall be five knuckle design with 63 mm (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 one catch for cabinet doors 1200 mm (48 inches) high and under, and two for doors over 1200 mm (48 inches) high.

E. Locks:

1. Cylinder type pin tumbler.
2. Equip doors and drawers where shown with locks.

F. Drawer and Door Pulls:

Doors and drawers shall have flush pulls, 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. Sliding Doors:

1. Each door shall be supported by two ball bearing bronze or nylon rollers, or sheaves riding on a stainless steel track at top or bottom, and shall be restrained by a nylon or stainless steel guide at the opposite end.
2. Plastic guides are not acceptable.

3. Each door shall have rubber silencers set near top and bottom of each jamb.

I. Shelf Standards (Except For Fixed Shelves):

Bright zinc-plated steel for recessed mounting with screws, 16 mm (5/8 inch) wide by 5 mm (3/16 inch) high providing 13 mm (1/2 inch) adjustment, complete with shelf supports.

J. Gate Bolt:

Surface mounted barrel type with strike.

2.8 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 or particleboard as follows:

1. Where shown, all semi-concealed surfaces shall be plastic laminated.

E. 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.

F. Countertops:

1. Countertops, splashbacks shall be plastic laminate factory glued to either a plywood (PS1), or particleboard (CPA A208.1) core.

2. Countertops shall be 3/4 inch.

3. Splashbacks 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 with plastic.

G. Sink bowls:

1. Refer to Plumbing Specifications.

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. Provide Fire Retardant Wood Blocking where required to provide adequate structure to support all wall mounted components.

- - - E N D - - -

SECTION 12 36 00
COUNTERTOPS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies plastic laminate casework countertops as shown on drawings.

1.2 RELATED WORK

- A. Color and patterns of plastic laminate: refer to drawings.
- B. DIVISION 22, PLUMBING.
- C. DIVISION 26, ELECTRICAL.
- D. Equipment Reference Manual for SECTION 12 36 00, COUNTERTOPS.

1.3 SUBMITTALS

- A. Submit in accordance with SECTION 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings
 - 1. Show dimensions of section and method of assembly.
 - 2. Show details of construction at 1/2 scale.
- C. Samples:
 - 1. 150 mm (6 inch) square samples each top.
 - 2. Front edge, back splash, end splash and core with surface material and booking.

1.4 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. Composite Panel Association (CPA):
 - A208.1-99.....Particleboard
 - A135.4-04.....Basic Hardboard
- C. American Society of Mechanical Engineers (ASME):
 - A112.18.1-05.....Plumbing Fixture Fittings
 - A112.1.2-04.....Air Gaps in Plumbing System
- D. American Society for Testing and Materials (ASTM):
 - A167-99 (2004).....Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

- A1008-08a.....Steel, Sheet, Cold-Rolled, Carbon, Structural,
High Strength, Low Alloy
- D256-06ae1.....Pendulum Impact Resistance of Plastic
- D570-98(2005).....Water Absorption of Plastics
- D638-08.....Tensile Properties of Plastics
- D785-08.....Rockwell Hardness of Plastics and Electrical
Insulating Materials
- D790-07e1.....Flexural Properties of Unreinforced and
Reinforced Plastics and Electrical Insulating
Materials
- D4690-99 (2005).....Urea-Formaldehyde Resin Adhesives
- G21-96 (2002).....Determining Resistance of Synthetic Polymeric
Materials to Fungi
- E. Federal Specifications (FS):
- A-A-1936.....Adhesive, Contact, Neoprene Rubber
- F. U.S. Department of Commerce, Product Standards (PS):
- PS 1-07.....Structural Plywood
- G. National Electrical Manufacturers Association (NEMA):
- LD 3-05.....High Pressure Decorative Laminates

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plastic Laminate: NEMA LD 3.
1. Concealed backing sheet Type BKL.
 2. Decorative surfaces:
 - a. Flat components: Type GP-HGL.
 - b. Post forming: Type PF-HGP.
- B. Sheet Steel: ASTM A1008, cold rolled, Class 1 finish, stretcher leveled.
- C. Particleboard: CPA A208.1, Grade 2-M-2.
- D. Plywood: PS 1, Exterior type, veneer grade AC not less than five ply construction.
- E. Adhesive
1. For plastic laminate FS A-A-1936.
 2. For wood products: ASTM D4690, unextended urea resin or unextended melamine resin, phenol resin, or resorcinol resin.

3. For Field Joints:

- a. Epoxy type, resistant to chemicals as specified for plastic laminate laboratory surfaces.
- b. Fungi resistant: ASTM G-21, rating of 0.

F. Fasteners:

1. Metals used for welding same metal as materials joined.
2. Use studs, bolts, spaces, threaded rods with nuts or screws suitable for materials being joined with metal splice plates, channels or other supporting shape.
3. Cast into sheet form and bowl form.
4. Color throughout with subtle veining through thickness.
5. Dupont "Corian" is acceptable if meeting the above properties.
6. Joint adhesive and sealer: Manufacturers silicone adhesive and sealant for joining methyl methacrylic polymer sheet.

2.2 SINKS

B. Stainless Steel:

1. ANSI/ASME A112.19.3, Type 304.
2. Self rim for plastic laminate or similar tops with concealed fasteners.
3. Flat rim for welded into stainless steel tops.
4. Ledge back or ledge sides with holes to receive required fixtures when mounted on countertop.
5. Apply fire resistant sound deadening material to underside.

2.3 TRAPS AND FITTINGS

A. Material as specified in DIVISION 22, PLUMBING.

B. For Stainless Steel Sinks:

1. Either cast or wrought brass or stainless steel P-traps and drain fittings; ASME A112.18.1
2. Flat strainer, except where cup strainer or overflow standpipe specified.
 - a. Provide cup strainer in cabinet type 1B.
 - b. Provide stainless steel overflow stand pipe to within 38 mm (1-1/2 inches) of sink rim.
3. Exposed surface chromium plated finish.

2.4 WATER FAUCETS

A. ASME A112.18.1.

1. Cast or forged brass, compression type with replaceable seat and stem assembly or replaceable cartridge.
2. Indexed lever handles either with or without head.
3. Gooseneck minimum clearance above countertop of 190 mm (7-1/2 inches), bent 180 degrees for vertical discharge.
4. Swing spouts elevated to clear handles.
5. Exposed brass surfaces chromium plated.
6. Cast combination hot and cold fixture with one piece body for multiple outlets.
7. Adapter type connection which will permit field conversion of swing spouts to fixed or gooseneck grouts or vice versa.
8. Pedestals Top for Laboratory or Pharmacy:
 - a. Modern design tapered to a round base, factory assembled and tested.
 - b. Brass shanks, locknuts and washers for attaching to top or curbs.

B. Automatic Controlled Faucets.

1. Infra-red photocell sensor and a solenoid valve to control water flow automatically.
2. Breaking light beam activates water flow.
3. Water stops when user moves away from light beam.

2.10 COUNTERTOPS

- A. Fabricate in largest sections practicable.
- B. Fabricate with joints flush on top surface.
- C. Fabricate countertops to overhang front of cabinets and end of assemblies 25 mm (one inch) except where against walls or cabinets.
- D. Provide 1 mm (0.039 inch) thick metal plate connectors or fastening devices (except epoxy resin tops).
- E. Join edges in a chemical resistant waterproof cement or epoxy cement, except weld metal tops.
- F. Fabricate with end splashes where against walls or cabinets.
- G. Splash Backs and End Splashes:
 1. Not less than 19 mm (3/4 inch) thick.
 2. Height 100 mm (4 inches) unless noted otherwise.

3. Laboratories and pharmacy heights or where fixtures or outlets occur:
Not less than 150 mm (6 inches) unless noted otherwise.
 4. Fabricate epoxy splash back in maximum lengths practical of the same material.
- H. Drill or cutout for sinks, and penetrations.
1. Accurately cut for size of penetration.
 2. Cutout for VL 81 photographic enlarger cabinet.
 - a. Finish cutout to fit flush with vertical side of cabinet, allowing adjustable shelf to fit into cutout space of cabinet at counter top level. Finish cutout surface as an exposed edge.
 - b. Provide braces under enlarger space to support not less than 45 kg (100 pounds) centered on opening side along backsplash.
- I. Plastic Laminate Countertops:
1. Fabricate plastic laminate on five-ply plywood or particleboard core 19 mm (3/4 inch) thick with plastic laminate backing sheet.
 2. Front edge over cabinets not less than 38 mm (1-1/2 inches) thick except where plastic "T" insert is used, not less than 19 mm (3/4 inch) thick.
 3. Exposed Surface and edges of decorative laminated plastic or laboratory chemical resistant surface.
 - a. Use chemical resistant surface on tops 6A, 6B, and 6C.
 - b. Use decorative surface tops when noted plastic laminate, for tops 10A, 10B and 10C.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Before installing countertops verify that wall surfaces have been finished as specified and that mechanical and electrical service locations are as required.
- B. Secure countertops to supporting rails of cabinets with metal fastening devices, or screws through pierced slots in rails.
 1. Where type, size or spacing of fastenings is not shown or specified, submit shop drawings showing proposed fastenings and method of installation.
 2. Use round head bolts or screws.

3. Use epoxy or silicone to fasten the epoxy resin countertops to the cabinets.
4. Use wood or sheet metal screws for wood or plastic laminate tops; minimum penetration into top 16 mm (5/8 inch), screw size No 8, or 10.

C. Rubber Moldings:

1. Where shown install molding with butt joints in horizontal runs and mitered joints at corners where ceramic tile occurs omit molding.
2. Fasten molding to wall and to splashbacks and splashends with adhesive.

D. Sinks

1. Install stainless steel sink in plastic laminate tops with epoxy compound to form watertight seal under shelf rim.
 - a. In laboratory and pharmacy fit stainless steel sink with overflow standpipe.
 - b. Install faucets and fittings on sink ledges with watertight seals where shown.

E. Faucets, Fixtures, and Outlets:

1. Seal opening between fixture and top.
2. Secure to top with manufacturers standard fittings.

3.2 PROTECTION AND CLEANING

- A. Tightly cover and protect against dirt, water, and chemical or mechanical injury.
- B. Clean at completion of work.

- - - E N D - - -