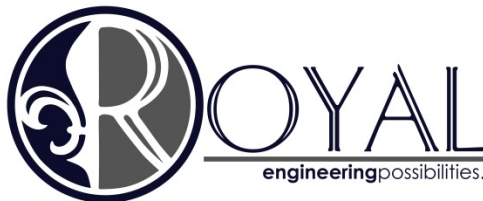




PROJECT MANUAL
FOR
VA MEDICAL CENTER KERRVILLE, TX
REPLACE/UPGRADE FIRE DOOR SYSTEMS
VA PROJECT NO.: 671A4-15-125
REC PROJECT NO.: 2015-11-03

ISSUED FOR CONSTRUCTION

July 21, 2016



Royal Engineers & Consultants, LLC
Texas Registered Engineering Firm 14191

**DEPARTMENT OF VETERANS AFFAIRS
VHA MASTER SPECIFICATIONS**

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STATEMENT OF WORK

1.1 APPLICABLE PUBLICATIONS

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

1. American Society of Safety Engineers (ASSE):
 - a. A10.1-2011.....Pre-Project & Pre-Task Safety and Health Planning
 - b. A10.34-2012.....Protection of the Public on or Adjacent to Construction Sites
 - c. A10.38-2013.....Basic Elements of an Employer's Program to Provide a Safe and Healthful Work Environment American National Standard Construction and Demolition Operations
2. American Society for Testing and Materials (ASTM):
 - a. E84-2013.....Surface Burning Characteristics of Building Materials
3. National Fire Protection Association (NFPA):
 - a. 10-2013.....Standard for Portable Fire Extinguishers
 - b. 30-2012.....Flammable and Combustible Liquids Code
 - c. 51B-2014.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work
 - d. 70-2014.....National Electrical Code
 - e. 70B-2013.....Recommended Practice for Electrical Equipment Maintenance
 - f. 70E-2012Standard for Electrical Safety in the Workplace
 - g. 99-2012.....Health Care Facilities Code
 - h. 241-2013.....Standard for Safeguarding Construction, Alteration, and Demolition Operations
4. The Joint Commission (TJC)
 - a. TJC ManualComprehensive Accreditation and Certification Manual
5. U.S. Occupational Safety and Health Administration (OSHA):
 - a. 29 CFR 1904Reporting and Recording Injuries & Illnesses
 - b. 29 CFR 1910Safety and Health Regulations for General Industry
 - c. 29 CFR 1926Safety and Health Regulations for Construction Industry
 - d. CPL 2-0.124.....Multi-Employer Citation Policy
6. VHA Directive 2005-007 - Fire Code Reviews of Delegated Construction Projects
7. VHA Directive 2011-036 - Safety and Health During Construction

General Requirements

1.2 DEFINITIONS

- A. OSHA "Competent Person" (CP) - One who is capable of identifying existing and predictable hazards in the surroundings and working conditions which are unsanitary, hazardous or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them (see 29 CFR 1926.32(f)).
- B. "Qualified Person" - one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.
- C. High Visibility Accident - Any mishap which may generate publicity or high visibility.
- D. Medical Treatment - Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered personnel.
- E. Recordable Injuries or Illnesses - Any work-related injury or illness that results in:
 - 1. Death, regardless of the time between the injury and death, or the length of the illness;
 - 2. Days away from work (any time lost after day of injury/illness onset);
 - 3. Restricted work;
 - 4. Transfer to another job;
 - 5. Medical treatment beyond first aid;
 - 6. Loss of consciousness; or
 - 7. A significant injury or illness diagnosed by a physician or other licensed health care professional, even if it did not result in (1) through (6) above.
- F. The APP (aka Construction Safety & Health Plan) - written contractor's policies that interface with the medical center's overall safety and health programs.

1.3 GENERAL INTENTION AND INITIAL ITEMS OF CONCERN

- A. The contractor shall furnish all labor, materials, equipment, supervision and all other necessary provisions to remove and replace all doors, frames and hardware as indicated in drawings and specifications. Contractor shall be responsible to repair and damage to finishes as a result of removing doors per scope of work.
- B. Visits to the site by bidders may be made only by appointment with the CO (Contracting Officer).
- C. All employees of the general contractor and the subcontractors shall comply with VA security management.
 - 1. All employees are to obtain construction employee identification badges before the employee starts. The badge is to be displayed so the construction employee full name and the responsible Medical Center service are seen.

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2. All employees are restricted from unauthorized access.

D. Prior to commencing work, the General Contractor shall provide proof that a OSHA certified "competent person" (CP) (29 CFR 1926.20(b)(2)) will maintain a presence at the work site whenever the General Contractor or subcontractors are present and working.

E. Training & Tuberculosis Screening:

1. All employees of general contractor and subcontractors shall have the 10-hour OSHA certified construction safety course and/or 30 hour Construction Safety training and relevant competency training, as determined by the COR or CSO in coordination with the Multi-disciplinary Team.

a. Submit training records of all such employees in compliances with section 1.22 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES with trade's submittal package before the start of the work.

2. When asked, all employees of the general contractor and subcontractors shall provide documentation of "no active Tuberculosis" that is dated within 90 calendar days of the employees' assignment to the project.

F. Preconstruction Conference:

1. Contractor representatives who have a responsibility or significant role in implementation of the accident prevention program, as required by 29 CFR 1926.20(b)(1) and 1.6 ACCIDENT PREVENTION PLAN, on the project shall attend the preconstruction conference to gain a mutual understanding of its implementation. This includes the project superintendent, subcontractor superintendents, and any other assigned safety and health professionals.

2. Discuss the details of the submitted APP to include incorporated plans, programs, procedures and a listing of anticipated AHAs that will be developed and implemented during the performance of the contract. This list of proposed AHAs will be reviewed at the conference and an agreement will be reached between the contractor and the contracting officer's representative as to which phases will require an analysis. In addition, establish a schedule for the preparation, submittal, review, and acceptance of AHAs to preclude project delays.

3. Deficiencies in the submitted APP will be brought to the attention of the contractor within 14 calendar days of submittal, and the contractor shall revise the plan to correct deficiencies and re-submit it for acceptance. Do not begin work until there is an accepted APP.

1.4 STATEMENT OF BID ITEM(S)

A. Base Bid: Remove and Replace all doors, frames and hardware as indicated in drawings and specifications.

1.5 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. BEFORE AWARD OF CONTRACT, The contractor should have existing conditions drawings, and this general requirement to make bid.

1.6 ACCIDENT PREVENTION PLAN (APP)

- A. The APP (aka Construction Safety & Health Plan) shall be having elements that are applicable to the specific site and type of work the contractor is contracted to perform.
1. The government shall consider the prime contractor to be the "controlling authority" for all worksite safety and health of each subcontractor(s). Contractors are responsible for informing their subcontractors of the safety provisions under the terms of the contract and the penalties for noncompliance, coordinating the work to prevent one craft from interfering with or creating hazardous working conditions for other crafts, and inspecting subcontractor operations to ensure that accident prevention responsibilities are being carried out.
- B. The APP shall be prepared as follows:
1. Written in English by a qualified person who is employed by the prime contractor articulating the specific work and hazards pertaining to the contract (model language can be found in ASSE A10.33). Specifically articulating the safety requirements found within these VA contract safety specifications.
 2. Address both the prime contractors and the subcontractors work operations.
 3. State measures to be taken to control hazards associated with materials, services, or equipment provided by suppliers.
 4. Address all the elements/sub-elements and in order as follows:
 - a. **SIGNATURE SHEET.** Title, signature, and phone number of the following:
 - 1) Plan preparer (Qualified Person such as corporate safety staff person or contracted Certified Safety Professional with construction safety experience);
 - 2) Plan approver (company/corporate officers authorized to obligate the company);
 - 3) Plan concurrence (e.g., Chief of Operations, Corporate Chief of Safety, Corporate Industrial Hygienist, project manager or superintendent, project safety professional). Provide concurrence of other applicable corporate and project personnel (Contractor).
 - b. **BACKGROUND INFORMATION.** List the following:
 - 1) Contractor;
 - 2) Contract number;
 - 3) Project name;
 - 4) Brief project description, description of work to be performed, and location; phases of work anticipated (these will require an AHA).
 - c. **STATEMENT OF SAFETY AND HEALTH POLICY.** Provide a copy of current corporate/company Safety and Health Policy Statement, detailing commitment to providing a safe and healthful workplace for all employees. The Contractor's written safety program goals, objectives, and accident experience goals for this contract should be provided.

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

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

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

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

f. TRAINING.

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

g. SAFETY AND HEALTH INSPECTIONS.

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

h. ACCIDENT INVESTIGATION & REPORTING. The Contractor shall conduct mishap investigations of all OSHA Recordable Incidents. The APP

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shall include accident/incident investigation procedure & identify person(s) responsible to provide the following to the Medical Center's Safety Service and the Contracting Officer Representative:

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

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

- 1) Emergency response ;
- 2) Contingency for severe weather;
- 3) Fire Prevention ;
- 4) Medical Support;
- 5) Posting of emergency telephone numbers;
- 6) Prevention of alcohol and drug abuse;
- 7) Site sanitation (housekeeping, drinking water, toilets);
- 8) Night operations and lighting ;
- 9) Hazard communication program;
- 10) Welding/Cutting "Hot" work ;
- 11) Electrical Safe Work Practices (Electrical LOTO/NFPA 70E);
- 12) General Electrical Safety
- 13) Hazardous energy control (Machine LOTO);
- 14) Site-Specific Fall Protection & Prevention;
- 15) Excavation/trenching;
- 16) Asbestos abatement;
- 17) Lead abatement;
- 18) Crane Critical lift;
- 19) Respiratory protection;
- 20) Health hazard control program;
- 21) Radiation Safety Program;
- 22) Abrasive blasting;
- 23) Heat/Cold Stress Monitoring;
- 24) Crystalline Silica Monitoring (Assessment);
- 25) Demolition plan (to include engineering survey);
- 26) Formwork and shoring erection and removal;
- 27) PreCast Concrete.

C. Submit the APP to the Contracting Officer Representative and the Contracting Officer for review for compliance with contract

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requirements in accordance with section 1.22 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES with trade's submittal package before the start of the work. Work cannot proceed without an accepted APP.

- D. Once accepted by the Contracting Officer Representative via the Medical Center's Safety Service, the APP and attachments will be enforced as part of the contract. Disregarding the provisions of this contract or the accepted APP will be cause for stopping of work, at the discretion of the Contracting Officer, until the matter has been rectified.
- E. Once work begins, changes to the accepted APP shall be made with the knowledge and concurrence of the Contracting Officer, and Contracting Officer Representative via the Medical Center's Safety Service. Should any severe hazard exposure, i.e. imminent danger, become evident, stop work in the area, secure the area, and develop a plan to remove the exposure and control the hazard. Notify the Contracting Officer within 24 hours of discovery. Eliminate/remove the hazard. In the interim, take all necessary action to restore and maintain safe working conditions in order to safeguard onsite personnel, visitors, the public (as defined by ASSE/SAFE A10.34) and the environment.

1.7 ACTIVITY HAZARD ANALYSES (AHAS)

- A. AHAs are also known as Job Hazard Analyses, Job Safety Analyses, and Activity Safety Analyses. Before beginning each work activity involving a type of work presenting hazards not experienced in previous project operations or where a new work crew or sub-contractor is to perform the work, the Contractor(s) performing that work activity shall prepare an AHA (Example electronic AHA forms can be found on the US Army Corps of Engineers web site or at the end of this spec.)
- B. AHAs shall define the activities being performed and identify the work sequences, the specific anticipated hazards, site conditions, equipment, materials, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level of risk.
- C. Work shall not begin until the AHA for the work activity has been accepted by the Medical Center's Safety Service and/or Contracting Officer Representative and discussed with all engaged in the activity, including the Contractor, subcontractor(s), and Government on-site representatives at preparatory and initial control phase meetings.
 - 1. The names of the Competent/Qualified Person(s) required for a particular activity (for example, excavations, scaffolding, fall protection, other activities as specified by OSHA and/or other State and Local agencies) shall be identified and included in the AHA. Certification of their competency/qualification shall be submitted to the Government Designated Authority (GDA) for acceptance prior to the start of that work activity.
 - 2. The AHA shall be reviewed and modified as necessary to address changing site conditions, operations, or change of competent/qualified person(s).
 - a. If more than one Competent/Qualified Person is used on the AHA activity, a list of names shall be submitted as an attachment to the AHA. Those listed must be Competent/Qualified for the type of work involved in the AHA and familiar with current site safety issues.
 - b. If a new Competent/Qualified Person (not on the original list) is added, the list shall be updated (an administrative action not

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requiring an updated AHA). The new person shall acknowledge in writing that he or she has reviewed the AHA and is familiar with current site safety issues.

3. Submit AHAs to the Medical Center's Safety Service and the Contracting Officer Representative for review for compliance with contract requirements in accordance with section 1.22 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Subsequent AHAs as shall be formatted as amendments to the APP. The analysis should be used during daily inspections to ensure the implementation and effectiveness of the activity's safety and health controls.
4. The AHA list will be reviewed periodically (at least monthly) at the Contractor supervisory safety meeting and updated as necessary when procedures, scheduling, or hazards change.
5. Develop the activity hazard analyses using the project schedule as the basis for the activities performed. All activities listed on the project schedule will require an AHA. The AHAs will be developed by the contractor, supplier, or subcontractor and provided to the prime contractor for review and approval and then submitted to Medical Center's Safety Service and the Contracting Officer Representative.

1.8 CONSTRUCTION SECURITY

A. Security Plans and Procedures:

1. General Contractor's employees shall not enter the project site without their appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.
2. For working during the non-business hours, the General Contractor shall give three (3) calendar day notice to the Contracting Officer and the Contracting Officers Representative so that security arrangements can be provided. This notice is separate from any notices required for utility shutdown described later in the General Requirements.
3. No photography of VA premises is allowed without permission of the Contracting Officer or Contracting Officer Representative.
 - a. Photos must not contain images of patients and/or patient's information.
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.
5. For information protection the contractor will not have access to VA desktop computers nor will they have access to online resources belonging to the government while conducting this project.
6. The contractor will not have access to Patient Health Information (PHI) nor will they have the capability of accessing patient information during the services provided to the VA per the Medical Center's Privacy Officer.
7. All construction employees must present two (2) valid forms of Government issued identification when applying for a construction employee identification badge.

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B. Key Control:

1. The General Contractor shall be provide a key and/or lock combinations for the purpose of security and inspections of every area of project excluding tool boxes and parked machines. Any and all keys signed out to the contractor will be turned in at the final walkthrough or the cost of \$300/key not return will be deducted from the final payment.

C. Document Control:

1. 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.
2. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.
3. Notify the Contracting Officer and Site Security Officer immediately when there is a loss or compromise of "sensitive information".

D. Motor Vehicle Restrictions

1. For this project the contractor will not be provided with onsite parking or be provided with onsite material storage / lay-down area. Only deliveries are permitted.

E. Safety Permits:

1. The General Contractor and subcontractor employees will be required to use a "Working Safety in interstitial" Permit when working in the spaces between patient care floors.
 - a. This requires but not limited to notifying the safety office and the staff in areas intermediately below the workspace.
 - b. provide platforms and provide small weave netting beneath work areas. Secure platforms and netting to fix building structural components.
 - c. If platforms and netting cannot provide adequate protection from falling objects to the space below, the removal of staff and/or patients from the spaces below must be coordinated. No staff and/or patients may occupy the space during the entire duration of work in the interstitial.
 - d. Properly securing workers in interstitial spaces with harnesses to fix building structural components.
2. The General Contractor and subcontractor employees will be required to use a "Hot Work" Permit when performing welding, cutting, blazing, heat treating, pipe thawing, power-driven fasteners, hot riveting and similar activities that produce sparks, flames heat or flammable gases.
 - a. This requires the contractor to notify the safety office when hot work is performed. The permit includes certification of pre and post inspection of the work area for combustibile materials.
 - b. A firewatch will be needed during hot work activities.
3. The General Contractor and subcontractor employees will be required to complete a "LockOut/TagOut Inspection Checklist" prior to work on any utilities.

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- a. The checklist will be required before any utilities are de-energized.
 1. The contractor will be required to submit documentation pertaining to their Authorized Employees with LOTO training performing LOTO, documentation of their LOTO procedures, and documentation of an audit for their LOTO procedures in the last year. Submit in accordance with Section 1.22 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
4. When electrical utilities cannot be de-energized to perform work, an "Energized Electrical Work Permit" will be required.
 - a. The General Contractor and/or the subcontractors shall be required to have an electrically qualified person(s) to complete the permit and to attend a pre work coordination meetings.

1.9 FIRE SAFETY

- A. Fire Safety Plan: Establish and maintain a site-specific fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Contracting Officer Representative for review for compliance with contract requirements in accordance with section 1.22 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES prior to any construction employee beginning work. This plan may be an element of the Accident Prevention Plan.
- B. Site and Building Access: Maintain free and unobstructed access to facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.
- C. Temporary Construction Partitions:
 1. Install and maintain temporary construction partitions to provide smoke-tight separations between construction areas and adjoining areas. Construct partitions of gypsum board (flame spread rating of 25 or less in accordance with ASTM E84) on both sides of fire retardant metal steel studs. Extend the partitions through suspended ceilings to floor slab deck or roof with fire retardant polyethylene sheeting (NFPA 701-04). Seal joints and penetrations. At door openings, install Class C, ¾ hour fire/smoke rated doors with self-closing devices.
 2. Install one-hour fire-rated temporary construction partitions as shown on drawings to maintain integrity of existing exit stair enclosures, exit passageways, fire-rated enclosures of hazardous areas, horizontal exits, smoke barriers, vertical shafts and openings enclosures.
 3. Close openings in smoke barriers and fire-rated construction to maintain fire ratings.
- D. Temporary Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.
- E. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate Medical Center's Safety Service.
- F. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to the Contracting Officer Representative.

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- G. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.
- H. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.
- I. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours for fire alarm systems, and 10 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Contracting Officer Representative. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Resident Engineer.
- J. Smoke Detectors: Prevent accidental operation. Provide temporary covers during construction activities and remove temporary covers at end of work operations each day. Coordinate with Contracting Officer Representative.
- K. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Medical Center's Safety Service. Obtain permits from Medical Center's Safety Service at least 12 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.
 - 1. Welding and cutting: As specified in the permits section, Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Medical Center's Safety Service and the COR. Obtain permits from Medical Center's Safety Service 12 hours in advance.
- L. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Contracting Officer Representative.
- M. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.
- N. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.
- O. If required, submit documentation to the COR that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features include in the Accident Prevention Plan.

1.10 OPERATIONS AND STORAGE AREAS

- A. The Contractor shall confine all operations (including storage of materials) in the foot print of the defined work area. 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. The Contractor shall, under regulations prescribed by the Contracting Officer, use only established roadways. When materials are transported

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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.

(FAR 52.236-10)

- C. Delivery Drivers and employee are subject to rules of Medical Center applicable to their conduct.
- D. 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 COR where required by limited working space.
 - 1. Do not store materials and equipment in other than assigned areas.
 - 2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two work days. Provide unobstructed access to Medical Center areas required to remain in operation.
- E. Utilities Services: Maintain existing utility services for Medical Center at all times. Where necessary to cut existing water, steam, gases, sewer or air pipes, or conduits, wires, cables, etc. of utility services or of fire protection systems and communications systems (including telephone), they shall be cut and capped at suitable places where shown; or, in absence of such indication, where directed by COR.
 - 1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of COR. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished, work on any energized circuits or equipment shall not commence without the Medical Center Safety service office prior knowledge and written approval. (see permits)
 - 2. Contractor shall submit a request to interrupt any such services to COR, in writing, 72 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.
 - 3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center. Interruption time approved by safety office may occur at times other than the standard business hours.
 - 4. Major interruptions where utilities cannot be shutdown of any system must be requested, in writing, at least 7 calendar days prior to the desired time and shall be performed as directed by the COR.
 - 5. In case of a contract construction emergency, service will be interrupted on approval of COR. Such approval will be confirmed in writing as soon as practical.

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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.
- F. Abandoned Lines: All service lines such as wires, cables, conduits, ducts, pipes and the like, and their hangers or supports, which are not to be abandoned but are to be removed entirely up to the source panel, trunk line, shall be sealed, capped or plugged. The lines shall not be capped in finished areas, but shall be removed and sealed, capped or plugged in ceilings, within furred spaces, in unfinished areas, or within walls or partitions; so that they are completely behind the finished surfaces.

1.11 INFECTION CONTROL

- A. Infection Control is critical in all medical center facilities. Interior construction activities causing disturbance of existing dust, or creating new dust, must be conducted within ventilation-controlled areas that minimize the flow of airborne particles into patient areas.
- B. An AHA associated with infection control will be performed by VA personnel in accordance with FGI Guidelines (i.e. Infection Control Risk Assessment (ICRA)). The ICRA procedure found on the American Society for Healthcare Engineering (ASHE) website will be utilized. Risk classifications of Class II or lower will require approval by the infection control service. Risk classifications of Class III or higher will require a permit before beginning any construction work. Infection Control permits will be issued by the infection control service via the COR. The Infection Control Permits will be posted outside the appropriate construction area. More than one permit may be issued for a construction project if the work is located in separate areas requiring separate classes. The primary project scope area for this project is: **Class [_____]**, however, work outside the primary project scope area may vary. The required infection control precautions with each class are as follows:
 1. Class I requirements:
 - a. During Construction Work:
 - 1) Notify the Contracting Officer Representative
 - 2) Execute work by methods to minimize raising dust from construction operations.
 - 3) Ceiling tiles: Immediately replace a ceiling tiles displaced for visual inspection.
 - 4) Portable Ceiling Access Module may be needed in patient care areas.
 - b. Upon Completion:
 - 1) Clean work area upon completion of task
 - 2) Notify the Contracting Officer Representative
 2. Class II requirements:
 - a. During Construction Work:
 - 1) Notify the Contracting Officer Representative

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- 2) Provide active means to prevent airborne dust from dispersing into atmosphere such as wet methods or tool mounted dust collectors where possible.
- 3) Water mist work surfaces to control dust while cutting.
- 4) Seal unused doors with duct tape.
- 5) Block off and seal air vents.
- 6) Remove or isolate HVAC system in areas where work is being performed.
- 7) Place adhesive walk off mat at entrance and exit of work area
- 8) Post sign cautioning about spread of dust
- 9) Portable Ceiling Access Module may be required in patient care areas

b. Upon Completion:

- 1) Wipe work surfaces with cleaner/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) Upon completion, restore HVAC system where work was performed
- 5) Notify the Contracting Officer Representative

3. Class III requirements:

a. During Construction Work:

- 1) Include all during construction work provisions of class II requirements.
- 2) Obtain permit from the Contracting Officer Representative
- 3) Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.
- 4) Complete all critical barriers i.e. sheetrock, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. Install construction barriers and ceiling protection carefully, outside of normal work hours unless otherwise noted.
 - i. Barrier must be constructed of fire rated material from floor to decking at interstitial level.
 - ii. Barrier at the patient access floor level must have a one hour fire rating.
- 5) Maintain negative air pressure, 0.01 inches of water gauge, within work site utilizing HEPA equipped air filtration units and continuously monitored with a digital display, recording and alarm instrument, which must be calibrated on installation, maintained with periodic calibration and monitored by the contractor. Exhaust hoses must be routed outside of building away from intake ventilation.

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- 6) Contain construction waste before transport in tightly covered containers.
 - 7) Cover transport receptacles or carts. Tape covering unless using a solid lid.
 - b. Upon Completion:
 - 1) Do not remove barriers from work area until completed project is final cleaned with disinfectant by the contractor and is inspected by the Contracting Officer Representative.
 - 2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
 - 3) Vacuum work area with HEPA filtered vacuums.
 - 4) Wet mop area with cleaner/disinfectant.
 - 5) Upon completion, restore HVAC system where work was performed.
 - 6) Return permit to the Contracting Officer Representative
4. Class IV requirements:
- a. During Construction Work:
 - 1) Include all during construction work provisions of class II & Class III requirements.
 - 2) Obtain permit from the Contracting Officer Representative
 - 3) Isolate HVAC system in area where work is being done to prevent contamination of duct system.
 - 4) Seal holes, pipes, conduits, and punctures.
 - 5) Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.
 - 6) All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.
 - b. Upon Completion:
 - 1) Do not remove barriers from work area until completed project is final cleaned with disinfectant by the contractor and is inspected by the Contracting Officer Representative.
 - 2) Remove construction barriers and ceiling protection carefully to minimize spreading of dirt and debris associated with construction, outside of normal work hours.
 - 3) Contain construction waste before transport in tightly covered containers.
 - 4) Cover transport receptacles or carts. Tape covering unless solid lid.
 - 5) Vacuum work area with HEPA filtered vacuums.
 - 6) Wet mop area with cleaner/disinfectant.
 - 7) Upon completion, restore HVAC system where work was performed.
 - 8) Return permit to the Contracting Officer Representative.

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- C. Barriers shall be erected as required based upon classification (Class III & IV requires barriers) and shall be constructed as follows:
1. Class III and IV - closed door with masking tape applied over the frame and door is acceptable for projects that can be contained in a single room.
 2. Construction, demolition or reconstruction not capable of containment within a single room must have the following barriers erected and made presentable on hospital occupied side:
 - a. Class III & IV (where dust control is the only hazard, and an agreement is reached with the Resident Engineer and Medical Center) - Airtight plastic barrier that extends from the floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping
 - b. Class III & IV - Drywall barrier erected with joints covered or sealed to prevent dust and debris from escaping.
 - c. Class III & IV - Seal all penetrations in existing barrier airtight
 - d. Class III & IV - Barriers at penetration of ceiling envelopes, chases and ceiling spaces to stop movement air and debris
 - e. Class IV only - Anteroom or double entrance openings that allow workers to remove protective clothing or vacuum off existing clothing
 - f. Class III & IV - At elevators shafts or stairways within the field of construction, overlapping flap minimum of two feet wide of polyethylene enclosures for personnel access.
- D. Products and Materials:
1. Sheet Plastic: Fire retardant polystyrene, 6-mil thickness meeting local fire codes
 2. Barrier Doors: Self Closing $\frac{3}{4}$ hour fire-rated solid core wood in steel frame, painted use classroom/storeroom function keypad reader (Schlage CO-100-CY-70-KY or equivalent)
 3. High Efficiency Particulate Air-Equipped filtration (HEPA) machine rated at 95% capture of 0.3 microns including pollen, mold spores and dust particles. HEPA filters should have ASHRAE 85 or other pre-filter to extend the useful life of the HEPA. Provide both primary and secondary filtrations units. Maintenance of equipment and replacement of the HEPA filters and other filters will be in accordance with manufacturer's instructions.
 4. Exhaust Hoses: flexible steel reinforced; Ventilation Blower Hose
 5. Adhesive Walk-off Mats: Provide minimum size mats of 24 inches x 36 inches
 6. Disinfectant: Hospital-approved disinfectant or equivalent product
 7. Portable Ceiling Access Module
- E. Before any construction on site begins, all contractor personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures established by the medical center.
1. All personnel involved in the construction or renovation activity shall be educated and trained in infection prevention measures

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established by the medical center. Infection prevention measures must be renewed once every fiscal year (by October 1st) regardless of when training was completed in the previous fiscal year.

- F. A dust control program will be establish and maintained as part of the contractor's infection preventive measures in accordance with the FGI Guidelines for Design and Construction of Healthcare Facilities. Prior to start of work, prepare a plan detailing project-specific dust protection measures with associated product data, including periodic status reports, and submit to the COR for review for compliance with contract requirements in accordance with 1.22 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES prior to any construction employee beginning work.
- G. The contractor will monitor for airborne disease (e.g. aspergillosis) during construction. A baseline of conditions will be established by the contractor prior to the start of work and periodically during the construction stage to determine impact of construction activities on indoor air quality with safe thresholds established.
- H. In general, the following preventive measures shall be adopted during construction to keep down dust and prevent mold.
 - 1. Contractor shall verify that construction exhaust to exterior is not reintroduced to the medical center through intake vents, or building openings. HEPA filtration is required where the exhaust dust may reenter the medical center.
 - 2. Exhaust hoses shall be exhausted so that dust is not reintroduced to the medical center.
 - 3. Adhesive Walk-off/Carpet Walk-off Mats shall be used at all interior transitions from the construction area to occupied medical center area. These mats shall be changed as often as required to maintain clean work areas directly outside construction area at all times.
 - 4. Vacuum and wet mop all transition areas from construction to the occupied medical center at the end of each workday. Vacuum shall utilize HEPA filtration. Maintain surrounding area frequently. Remove debris as it is created. Transport these outside the construction area in containers with tightly fitting lids.
 - 5. The contractor shall not haul debris through patient-care areas without prior approval of the Resident Engineer and the Medical Center. When, approved, debris shall be hauled in enclosed dust proof containers or wrapped in plastic and sealed with duct tape. No sharp objects should be allowed to cut through the plastic. Wipe down the exterior of the containers with a damp rag to remove dust. All equipment, tools, material, etc. transported through occupied areas shall be made free from dust and moisture by vacuuming and wipe down.
 - 6. There shall be no standing water during construction. This includes water in equipment drip pans and open containers within the construction areas. All accidental spills must be cleaned up and dried within 12 hours. Remove and dispose of porous materials that remain damp for more than 72 hours.
 - 7. At completion, remove construction barriers and ceiling protection carefully, outside of normal work hours. Vacuum and clean all surfaces free of dust after the removal.
- I. Final Cleanup:

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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.

1.12 TUBERCULOSIS SCREENING

- A. All contractor employees assigned to the work site shall have a certified tuberculin screening completed within 90 days prior to assignment at the work site. The certified tuberculin screening must be kept update every calendar year from the date submitted in the initial certified tuberculin screening documentation. NOTE: This can be the Center for Disease Control (CDC) and Prevention and two-step skin testing or a Food and Drug Administration (FDA)-approved blood test.
 1. Contract employees manifesting positive screening reactions to the tuberculin shall be examined according to current CDC guidelines prior to working on VHA property.
 2. Subsequently, if the employee is found without evidence of active (infectious) pulmonary TB, a statement documenting examination by a physician shall be on file with the employer (construction contractor), noting that the employee with a positive tuberculin screening test is without evidence of active (infectious) pulmonary TB.
 3. If the employee is found with evidence of active (infectious) pulmonary TB, the employee shall require treatment with a subsequent statement to the fact on file with the employer before being allowed to return to work on VHA property.

1.13 ELECTRICAL

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

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

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

1.14 FALL PROTECTION, SCAFFOLDS, LADDERS AND OTHER EQUIPMENT

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

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4. Fall protection while using a ladder will be governed by the OSHA requirements.
- B. All scaffolds and other work platforms construction activities shall comply with 29 CFR 1926 Subpart L.
- C. The fall protection (FP) threshold height requirement is 6 ft (1.8 m) as stated in Section 1.16.
- D. The following hierarchy and prohibitions shall be followed in selecting appropriate work platforms.
 1. Scaffolds, platforms, or temporary floors shall be provided for all work except that can be performed safely from the ground or similar footing.
 2. Ladders less than 20 feet may be used as work platforms only when use of small hand tools or handling of light material is involved.
 3. Ladder jacks, lean-to, and prop-scaffolds are prohibited.
 4. Emergency descent devices shall not be used as working platforms.
- E. Contractors shall use a scaffold tagging system in which all scaffolds are tagged by the Competent Person. Tags shall be color-coded: green indicates the scaffold has been inspected and is safe to use; red indicates the scaffold is unsafe to use. Tags shall be readily visible, made of materials that will withstand the environment in which they are used, be legible and shall include:
 1. The Competent Person's name and signature;
 2. Dates of initial and last inspections.
- F. Mast Climbing work platforms: When access ladders, including masts designed as ladders, exceed 20 ft (6 m) in height, positive fall protection shall be used.
- G. Ladders
 1. All Ladder use shall comply with 29 CFR 1926 Subpart X.
 2. All portable ladders shall be of sufficient length and shall be placed so that workers will not stretch or assume a hazardous position.
 3. Manufacturer safety labels shall be in place on ladders
 4. Step Ladders shall not be used in the closed position
 5. Top steps or cap of step ladders shall not be used as a step
 6. Portable ladders, used as temporary access, shall extend at least 3 ft (0.9 m) above the upper landing surface.
 - a. When a 3 ft (0.9-m) extension is not possible, a grasping device (such as a grab rail) shall be provided to assist workers in mounting and dismounting the ladder.
 - b. In no case shall the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.
 7. Ladders shall be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use. Broken or damaged ladders shall be immediately tagged "DO NOT USE," or with similar wording, and withdrawn from service until restored to a condition meeting their original design.

1.15 FLOOR & WALL OPENINGS

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

1.16 CONFINED SPACE ENTRY

- A. All confined space entry shall comply with 29 CFR 1910.146 except for specifically referenced operations in 29 CFR 1926 such as excavations/trenches [1926.651(g)].
- B. A site-specific Confined Space Entry Plan (including permitting process) shall be developed and submitted to the Contracting Officer Representative.
- C. Use the interstitial permit whenever entry into the floor space between floors is needed.

1.17 DISPOSAL AND RETENTION

- A. Materials and equipment accruing from work removed and from demolition of buildings or structures, or parts thereof, shall be disposed of as follows:
 - 1. Reserved items which are to remain property of the Government are noted on drawings or in specifications as items to be kept by the Government. Items that remain property of the Government shall be protected in such a manner as to prevent damage which would be detrimental to re-installation and/or reuse. Store such items where directed by COR.

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2. Items not reserved shall become property of the Contractor and be removed by Contractor from Medical Center.
3. Items of portable equipment and furnishings located in rooms and spaces in which work is to be done under this contract shall remain the property of the Government. When rooms and spaces are vacated by the Department of Veterans Affairs during the alteration period, such items which are NOT required by drawings and specifications to be either relocated or reused will be removed by the Government in advance of work to avoid interfering with Contractor's operation.

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

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

(FAR 52.236-9)

1.19 RESTORATION

- A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the COR. Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the COR before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.
- B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.
- C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including

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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).

1.20 AS-BUILT DRAWINGS

- A. The contractor shall maintain one (1) set of as-built drawings which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.
- B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, as-built drawings shall be made available for the COR's review, as often as requested.
- C. Contractor shall deliver one approved completed sets of as-built drawings to the COR within 15 calendar days after each completed phase and after the acceptance of the project by the COR.

1.21 CONSTRUCTION WASTE MANAGEMENT

- A. REFERENCE: VA DIRECTIVE 0063, WASTE PREVENTION AND RECYCLING PROGRAM
- B. This section specifies the requirements for the management of non-hazardous building construction and demolition (C&D) waste.
- C. 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.
- D. 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.
- E. Contractor shall develop and implement procedures to reuse and recycle materials to a minimum of 50 percent.
- F. 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.
- G. 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> provides a Construction Waste Management Database that contains information on

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companies that haul, collect, and process recyclable debris from construction projects.

- H. 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.
- I. 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.
- J. Prepare and submit to the COR a written demolition debris management plan. The plan shall include, but not be limited to, the following information:
 - 1. Procedures to be used for debris management.
 - 2. Techniques to be used to minimize waste generation.
 - 3. Analysis of the estimated 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.
- K. Contractor will maintain 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.
- L. 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. The contractor will provide the COR a completed South Texas Veterans Health Care System Construction Waste Recycling form with each progress payment. (see attachments)

1.22 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

- A. Refer to Articles titled SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION (FAR 52.236-21) and, SPECIAL NOTES (VAAR 852.236-91), in GENERAL CONDITIONS.
- B. 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.
- C. 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:
 - 1. Satisfactory written evidence is presented to, and approved by Contracting Officer, that manufacturer cannot make scheduled delivery of approved item or;
 - 2. Item delivered has been rejected and substitution of a suitable item is an urgent necessity or;

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3. Other conditions become apparent which indicates approval of such substitute item to be in best interest of the Government.
- D. 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.
- E. Submittals will be reviewed for compliance with contract requirements by COR, and action thereon will be taken by COR on behalf of the Contracting Officer.
- F. Upon receipt of submittals, COR 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.
- G. The Government reserves the right to require additional submittals, whether or not particularly mentioned in this contract. If additional submittals beyond those required by the contract are furnished pursuant to request therefor by Contracting Officer, adjustment in contract price and time will be made in accordance with Articles titled CHANGES (FAR 52.243-4) and CHANGES - SUPPLEMENT (VAAR 852.236-88) of the GENERAL CONDITIONS.
- H. Schedules called for in specifications and shown on shop drawings shall be submitted for use and information of Department of Veterans Affairs and COR. However, the Contractor shall assume responsibility for coordinating and verifying schedules. The Contracting Officer and COR assumes no responsibility for checking schedules or layout drawings for exact sizes, exact numbers and detailed positioning of items.
- I. Submittals materials must be submitted by Contractor only and shipped prepaid. Contracting Officer assumes no responsibility for checking quantities or exact numbers included in such submittals.
 1. Submit samples in single units for materials unless otherwise specified. Submit shop drawings, schedules, manufacturers' literature and other items needing approvals electronically.
 2. Submittals will receive consideration only when covered by a transmittal letter signed by the contractor. Letter shall be sent via E-Mail unless the submittal contains hard samples 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.
 - a. 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.
 - b. 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.

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- c. Required certificates shall be signed by an authorized representative of manufacturer or supplier of material, and by Contractor.
- J. 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.
- K. Approved samples will be kept on file by the COR at the site until completion of contract, at which time such samples will be delivered to Contractor as Contractor's property. Where noted in technical sections of specifications, approved samples in good condition may be used in their proper locations in contract work. At completion of contract, samples that are not approved will be returned to Contractor only upon request and at Contractor's expense. Such request should be made prior to completion of the contract. Disapproved samples that are not requested for return by Contractor will be discarded after completion of contract.
- L. 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, vellum or PDF reproducible.
 - 2. Reproducible shall be full size. (30" x 42")
 - 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. For submitting hardcopy drawings: Prepare drawing in 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 COR under one cover.
- M. Samples shop drawings, test reports, certificates and manufacturers' literature and data, shall be submitted for approval to

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(COR) (E-mail)(mail stop)

7400 Merton Minter Boulevard

(COR P.O. Address)

San Antonio, Texas 78229

(City, State and Zip Code)

General Requirements

1.23 PROJECT SCHEDULES (SMALL PROJECTS - DESIGN/BID/BUILD)

A. GENERAL

1. DESCRIPTION:

- a. The Contractor shall develop a bar Gantt schedule demonstrating fulfillment of the contract requirements (Project Schedule), and shall keep the Project Schedule up-to-date in accordance with the requirements of this section and shall utilize the plan for scheduling, coordinating and monitoring work under this contract (including all activities of subcontractors, equipment vendors and suppliers).

2. CONTRACTOR'S REPRESENTATIVE:

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

3. THE COMPLETE PROJECT SCHEDULE SUBMITTAL

- a. Within 14 calendar days after receipt of Notice to Proceed, the Contractor shall submit for the Contracting Officer's review one (1) electronic copy of the schedule showing all material lead time for material, trade used in the project, and phasing. Include events that show shutdowns, startups and effected areas. The schedule must show the work activate logic that is optimized to provide the least amount of downtime to the Medical Center's domestic water. The complete working schedule shall include a narrative on the Contractor's ration to scheduling the complete project.

4. PROJECT SCHEDULE REQUIREMENTS

- a. Show on the project schedule the sequence of work activities/events required for complete performance of all items of work. The Contractor Shall:
 1. Show activities/events as:
 - i. Interruption of VA Facilities utilities, project phasing, subcontracted trades, and any other specification requirements.
- b. The Contractor shall submit the following supporting data in addition to the project schedule:
 1. The appropriate project calendar including working days and holidays.
 2. The planned number of shifts per day.
 3. The number of hours per shift.
- c. To the extent that the Project Schedule or any revised Project Schedule shows anything not jointly agreed upon, it shall not be deemed to have been approved by the COR. Failure to include any

General Requirements

element of work required for the performance of this contract shall not excuse the Contractor from completing all work required within any applicable completion date of each phase regardless of the COR's approval of the project schedule. Failure of the Contractor to include this data shall delay the review of the submittal until the Contracting Officer is in receipt of the missing data.

- - E N D - - -

Attachments

INFECTION CONTROL RISK ASSESSMENT (IRCA) CONSTRUCTION PERMIT

PROJECT TITLE: _____
 SUPERINTENDENT: _____ PHONE NUMBER: _____
 CONTRACT OFFICERS REPRESENTATIVE: _____
 PHONE NUMBER: _____ EST. DATES OF CONSTRUCTION: _____
 PROJECT # _____ BUILDING # _____ 1 _____ FLOOR# _____
 AFFECTED SERVICE(S) _____

References reverse side for Definitions and IC Construction Activity Matrix Circle the appropriate class of this project.

SUMMARY OF RECOMMENDED PROCEDURES BASED ON CLASS

CLASS 1 _____ Date _____ Initials	<ol style="list-style-type: none"> 1. Execute work by methods to minimize raising dust. 2. Immediately replace any ceiling tile displaced for visual inspection. 3. Minor demolition for remodeling.
CLASS 2 _____ Date _____ Initials	<ol style="list-style-type: none"> 1. Provide active means to prevent airborne dust from dispensing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Contain and transport waste in covered containers. 6. Wet mop and/or vacuum with HEPA filtered vacuum before leaving area. 7. Place dust mat at entrance and exit of work area. 8. Remove or isolate HVAC system in areas where work is being performed. 9. Post sign cautioning about spread of dust.
CLASS 3 _____ Date _____ Initials	<ol style="list-style-type: none"> 1. Notify IC for approval before construction begins. 2. Remove or isolate HVAC system. 3. Complete all barriers before construction begins. Dust barriers must be constructed of fire rated material from floor to decking at interstitial level. Dust barriers constructed at floor level must have a one hour fire rating. 4. Do not remove barriers until completed project is thoroughly cleaned. 5. Vacuum work with HEPA filter vacuum as required. 6. Wet mop with disinfectant. 7. Remove barrier materials carefully to minimized spreading of dirt and debris. 8. Contain and transport waste in covered containers. 9. Post sign cautioning about spread of dust. 10. Maintain negative pressure with HEPA filtration, exhaust must be routed to main ventilation or outside of building.
CLASS 4 _____ Date _____ Initials	<p>1-10 SAME as Class 3</p> <ol style="list-style-type: none"> 11. Seal holes, pipes, conduits, and punctures appropriately. 12. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work or their coveralls can be removed each time they leave the work site. 13. All personnel entering work site are required to wear shoe covers.

COMMENTS:

SIGNATURE OF INFECTION CONTROL REQUIRED FOR CLASS 3 & 4

DATE

INFECTION CONTROL CLASS IDENTIFICATION (I-IV)

TYPE OF CONSTRUCTION ACTIVITY → RISK LEVEL ▽	Type “A”	Type “B”	Type “C”	Type “D”
GROUP 1	I	II	II	III
GROUP 2	I	II	III	III
GROUP 3	I	III	III	IV
GROUP 4	III	III/IV	III/IV	IV

Use this matrix to determine **Class** of construction activity. Class is determined based on two factors: (1) type based on complexity of construction with Type A – being the least complex and Type D having the greatest complexity, and (2) risk level of construction area defined by group 1-4, low to high risk, respectively. Use the **Class** to determine preventive construction activities as identified on IC Construction Permit (See reverse side of form).

DEFINITION OF TYPES

<p>(1) Type A: Inspection and non-invasive activities including but not limited to removal of ceiling tiles for visual inspection limited to 1 tile per 50 square feet, painting (not sanding) wall covering, electrical trim work, minor plumbing; and other activities which do NOT generate dust or require cutting of walls or access to ceilings.</p> <p>(2) Type B: Small scale, short duration activities, which create minimal dust. Includes but not limited to installation of telephone and computer cabling, access to chase spaces, cutting of walls or ceiling where dust migration can be controlled.</p> <p>(3) Type C: Any work, which generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies. Includes but is not limited to sanding of wall for paint or wall-covering, removal of floor covering, ceiling tiles and casework, new wall construction, minor ductwork or electrical work above ceilings, major cabling activities, and any activity which cannot be completed within a single work shift.</p> <p>(4) Type D: Major demolition and construction projects. Includes but is not limited to activities which require consecutive work shifts, heavy demolition or removal of a complete ceiling system and new construction.</p>

DEFINITION OF IC RISK GROUP

GROUP 1 Lowest	GROUP 2 Medium	GROUP 3 Medium High	GROUP 4 Highest
<p>1. Office areas</p> <p>2. Non-clinical areas</p>	<p>1. Patient care areas where no invasive procedures are performed.</p>	<p>1. Urgent care</p> <p>2. Radiology/MRI</p> <p>3. Post anesthesia</p> <p>4. Day surgery</p> <p>5. Intensive care units</p> <p>6. Nuclear medicine</p> <p>7. Cafeteria</p> <p>8. EP labs</p> <p>9. Laboratories</p> <p>10. Inpatient units</p>	<p>1. bone marrow transplant unit</p> <p>2. Operating rooms</p> <p>3. Sterile processing</p> <p>4. Cardiac cath and special procedures</p> <p>5. Dialysis unit</p> <p>6. Oncology/Apheresis</p> <p>7. Anesthesia and pump area</p> <p>8. All endoscopy areas</p> <p>9. Pharmacy admixture</p>

PRE-CONSTRUCTION RISK ASSESSMENT (PRCA)

PROJECT:	DATE:
----------	-------

HAZARD	APPLICABLE		ACTION REQUIRED
Infection Control Risk Assessment (ICRA)	YES	NO	
Tuberculosis Screening	YES	NO	
National Environmental Policy Act (NEPA)	YES	NO	
Interim Life Safety Measures (ILSMs) (Egress, Fire Alarm, Fire Suppression, etc.)	YES	NO	
Air Quality (Smoke, Vapors, Dust, etc.)	YES	NO	
Noise	YES	NO	
Vibration	YES	NO	
Utility Disruptions	YES	NO	
Emergency Response Procedures	YES	NO	
Patient Accessibility	YES	NO	
Job Access (Patient Care Areas)	YES	NO	
Security (Badges and Physical Site)	YES	NO	
Traffic Flow	YES	NO	
Hazardous Materials	YES	NO	
SIGNATURES BY:			
AFFECTED SERVICE/SECTION CHIEF		DATE	
INFECTION CONTROL NURSE		DATE	
CONTRACTING OFFICER REPRESENTATIVE/COR		DATE	
CHIEF DESIGN SECTION		DATE	
CHIEF SAFETY SERVICE		DATE	

Construction and Demolition Waste Recycling Form

FY15 (1 Oct 2015 - 30 Sep 2016)

Progress payment period month: _____

Project # & Title: _____

Contractor: _____

Probability

1. Provide the total pounds of Construction and Demolition Debris generated:
2. Provide the total cost for disposal of Construction and Demolition Debris:
3. Provide the total pounds of Construction and Demolition Debris recycled:
4. Break out the total pounds of Construction and Demolition Debris recycled into the following categories:
 - a) Total pounds of wood recycled:
 - b) Total pounds of steel recycled:
 - c) Total pounds of cast iron recycled:
 - d) Total pounds of tin recycled:
 - e) Total pounds of aluminum recycled:
 - f) Total pounds of copper recycled:
 - g) Total pounds of lead recycled:

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REVIEW

Project/Proposed Action Title:				Location:				Date:	
				Project Number:					
Project/Proposed Action Purpose and Need:									
Project/Proposed Action Description:									
Part of a Larger or Continuing Effort?				<input type="checkbox"/> No		<input type="checkbox"/> Yes:			
Potential Impact	Pos	Neg	Insig	Unk	Potential Impact	Pos	Neg	Insig	Unk
Aesthetics					Flood Plains/ Wetlands				
Air Quality					Socioeconomics/Env Justice				
Cultural Resources					Community Services				
Water Resources					HAZMAT/Hazardous Waste				
Wildlife and Habitat					Transportation/Parking				
Community Noise					Utilities				
Land Use					Other:				
DETERMINATION									
<input type="checkbox"/> I find that the proposed project qualifies as a Categorical Exclusion (CATEX), with no extraordinary circumstances. The specific CATEX is: 5. Interior construction or renovation.									
<input type="checkbox"/> I find that the proposed project may have a significant effect on the environment, therefore an Environmental Assessment (EA) will be prepared.									
<input type="checkbox"/> The project clearly has significant environmental effects and an Environmental Impact Statement (EIS) will be prepared.									
Name				Signature				Date	
Submitted by Project Manager									
Approved by GEMS Coordinator									

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REVIEW

VA Categorical Exclusion List from 38 CFR Part 26.6(b)(1)

1. Repair, replacement, and new installation of primary or secondary electrical distribution systems;
2. Repair, replacement, and new installation of components such as windows, doors, roofs; and site elements such as sidewalks, patios, fences, retaining walls, curbs, water distribution lines, and sewer lines which involve work totally within VA property boundaries;
3. Routine VA grounds and facility maintenance activities;
4. Procurement activities for goods and services for routing facility operations maintenance and support;
5. Interior construction or renovation;
6. New construction of 75,000 gross square feet or less;
7. Development of 20 acres of land or less within an existing cemetery, or development on acquired land of five acres or less;
8. Actions which involve support or ancillary appurtenances for normal operation;
9. Leases, licenses, permits, and easements;
10. Reduction in force resulting from workload adjustments, reduced personnel or funding levels, skill imbalances or other similar causes;
11. VA policies, actions and studies which do not significantly affect the quality of the human environment;
12. Preparation of regulations, directives, manuals or other guidance that implement, but do not substantially change, the regulations, directives, manuals, or other guidance of higher organizational levels or another Federal agency; and
13. Actions, activities, or programs that do not require expenditure of Federal funds.

Extraordinary Circumstances from 38 CFR Part 26.6(b)(1)

1. Greater scope or size than normally experienced for a particular categorical exclusion
2. Actions in highly populated or congested areas
3. Potential for degradation, although slight, or existing poor environmental conditions
4. Use of unproven technology
5. Potential presence of an endangered species, archaeological remains, or other protected resources
6. Potential presence of hazardous or toxic substances

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REVIEW

Potential Impact	Considerations – will the action:
Aesthetics	Substantial adverse or positive effect on a scenic vista? Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? Substantially degrade or improve the existing visual character or quality of the site and its surroundings? Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?
Air Quality	Release substances for which there is a National Ambient Air Quality Standard (such as sulfur or nitrogen oxides, carbon monoxide, lead, particulates, volatile organics, etc)? Install devices with potential air quality impacts including incinerators, sterilizer equipment, generators, boilers, paint booths, lab hoods, industrial exhaust equipment, etc ? Create objectionable odors affecting a substantial number of people? Create significant dust during construction or operations?
Cultural Resources	Affect any structures or areas known to be historic or culturally important? (Projects/actions at KD, refer to historical survey)
Water Resources	Pump/remove or add/release water or waste to ground or surface water? Significantly increase or decrease (>1%) water usage.
Wildlife and Habitat	Affect any threatened and endangered species? Disturb birds/nesting areas? Damage or remove any trees? Displace wildlife? Be located near any potentially sensitive habitats (streams, forests, preserves, etc)
Community Noise	Create significant noise during construction or operations ?
Land Use	Fit with local zoning and land use?
Flood Plains/ Wetlands	Alter or disturb and flood plains, streams, creeks, pools, swamp, marsh, etc?
Socioeconomics/ Environmental Justice	Affect local community socioeconomics? Improve or degrade the living conditions of the local area with desirable/undesirable new facilities or operations?
Community Services	Create any additional requirements for local community fire, water, sewage, stormwater, police, schools, etc services?
HAZMAT/ Hazardous Waste	Increase the use or add new hazardous materials/hazardous waste? Install or remove fuel, oil, or other chemical tanks greater than 55 gallons? Increased emissions from spray or evaporation of hazmat Involve structures that contain asbestos containing material or lead-based paint? (Ask Safety Office for STX Facilities, see Phase I Environmental Site Assessment for transfer/purchase of other properties).
Transportation/ Parking	Improve or degrade access/egress of site, adjacent public roadways, public transportation systems, traffic flow, parking availability, etc?
Utilities	Add or remove any process plumbed/tied into the sanitary sewer (utility sinks, lab equipment, wash systems, water conditioning, filter back-flushing, etc)? Add or remove significant heating/cooling requirement? Add or remove significant electrical or drinking water system requirements?
Other:	Involve any other aspects that have the potential to create substantial public controversy?

Permits

Audie L. Murphy VA Hospital Division
Permit for Interstitial Entry (October 2012)

- All general contractors and sub-contractors must obtain a permit for DAILY entry into interstitial space from Safety Service. M&O and Biomed are required to obtain a permit for interstitial entry for construction work. M&O, Biomed, and Projects will not require a permit for routine maintenance or investigations, provided that all work is performed within the confines of the catwalk. Interstitial doors provide a barrier and must be closed at all times (including smoke wall hatch doors) and absolutely NO food, drink, or tobacco products are permitted.
- Before entering the interstitial space all personnel must complete one-time fall protection training and comply with STVHCS Policy Memorandum 007-12-04 (Working Safely in Interstitial Spaces). Fall protection training will be conducted by the competent person.
- Contractors will NOT route wire or cable through wire chases, pipe chases, and/or fire/smoke barriers without written authorization from the COR or Safety Service. The COR will record the location of penetrations of all wire chases or fire/smoke barriers, and ensure penetrations are sealed correctly with a NFPA/JC approved method/material. M&O staff must notify the Foreman of wire routing, fire/smoke barrier, and chase penetrations. The COR or M&O Foreman will be responsible to inspect all work completed in the interstitial by a contractor.

1. Contractor/Section/Department Name:	
2. Date:	
3. Name of Foreman/Competent Person and Contact Number:	
4. Floor of Interstitial:	
5. Nearest Stairwell/Elevator to Interstitial:	
6. Type of work being accomplished:	
a. Does work involve routing cabling, conduit, piping in interstitial space, specify smoke/fire barriers:	YES NO (CIRCLE ONE)
b. Does work involve routing cabling, conduit, piping via chase from floor to floor:	YES NO (CIRCLE ONE)
7. Will work be done on catwalk only:	YES NO (CIRCLE ONE)
8. COR/Foreman that has inspected the interstitial work area (Initials & Date):	
9. Review by Safety Office (Initials & Date):	

STVHCS Energized Electrical Work Permit

Under NFPA 70E, there are only three instances in which an employee can work on live parts. In these situations, a work permit must be completed and approved by an authorized person.

1. When de-energizing would interrupt essential life support, emergency alarms or ventilation systems.
2. When the organization can demonstrate that de-energizing the system would introduce additional or increased hazards or that it is infeasible due to equipment design or operational limitations.

PART 1 TO BE COMPLETED BY THE REQUESTER

Job/Work Order Number/Contract Number _____

1. Description of circuit/equipment/job location: _____
2. Description of work to be done: _____
3. Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage: _____

PART II: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS DOING THE WORK

Check when
Complete

1. Detailed job description procedure to be used in performing the above detailed work: _____ ☐
2. Description of the safe work practices to be employed: _____ ☐
3. Results of the shock hazard analysis: _____ ☐
4. Determination of shock protection boundaries: _____ ☐
5. Results of the flash hazard analysis: _____ ☐
6. Determination of the flash protection boundary: _____ ☐
7. Necessary personal protective equipment to safely perform the assigned task: _____ ☐
8. Means employed to restrict the access of unqualified persons from the work area: _____ ☐
9. Evidence of completion of job briefing including discussion of any job-related hazards: _____ ☐
10. Do you agree the above described work can be done safely? ☐ Yes ☐ No (if no, return to requester)

Electrically Qualified Person(s) _____

Date _____

PART III: APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED

Chief, Engineering _____

Maintenance/Engineering Manager _____

Safety Representative _____

Electrically Knowledgeably Person _____

Director's Signature _____ Date _____

Note: Once the work is complete, forward this form to the Safety Service for review and retention.

STVHCS HOT WORK PERMIT

Before initiating hot work, ensure precautions outlined in the checklist are in place.

The permit is required for any hot work activities such as welding, cutting, heat treating, grinding, thawing pipe, powder-driven fasteners, hot riveting, and similar applications producing or using a spark, flame, or heat.

PERMIT IS GOOD FOR 24 HOURS

Date:	Hot Work By: <input type="checkbox"/> Employee <input type="checkbox"/> Contractor
Time Started:	Name (print) and Signature of Hot Work Operator:
Time Completed:	
Location (Building/Floor/Room):	I verify that the location has been examined, the precautions, marked on the checklist below have been taken, and permission is granted. Name (print) and Signature of Permit-Authorizing Individual (PAI):
Task:	

- ☐ Available sprinklers, hose streams, and extinguishers are in service and operable
- ☐ Hot work equipment is in good working condition in accordance with manufacturer's specifications
- ☐ Fire detection devices have been disabled to prevent false fire alarms due to smoke spread

0

Requirements within 35 feet of hot work location

- ☐ Flammable liquid, dust, lint, and oily deposits removed
- ☐ Explosive atmosphere in area eliminated
- ☐ Floors swept clean and trash removed
- ☐ Combustible floors wet down or covered with damp sand or fire-resistive/noncombustible materials or equivalent
- ☐ Personnel protected from electrical shock when floors are wet
- ☐ Other combustible storage material removed or covered with listed or approved materials (welding pads, blankets, or curtains), metal shields, or noncombustible materials
- ☐ All wall and floor openings covered
- ☐ Ducts and conveyors that might carry sparks to distant combustible material covered, protected, or shut down

Requirements for hot work on walls, ceilings, or roofs

- ☐ Construction is noncombustible and without combustible coverings or insulation
- ☐ Combustible material on the other side of walls, ceilings, and/or roofs is relocated

Requirements for hot work on enclosed equipment

- ☐ Enclosed equipment is clean of all combustibles
- ☐ Containers are purged of flammable liquid/vapor
- ☐ Pressurized vessels, piping, and equipment are removed from service, isolated, and vented

Requirements for hot work, fire watch, and fire monitoring

- ☐ Fire watch is provided during and for a minimum of 30 minutes after hot work; including any break activity
- ☐ Fire watch is provided with suitable type and sufficient extinguishers
- ☐ Fire watch is trained in use of equipment in initiating the fire alarm
- ☐ Fire watch is required in adjoining areas, above and/or below
- ☐ Yes ☐ No Per the PAI/Fire watch, monitoring of hot work area has been extended beyond 30 minutes

FIRE ALARM/SPRINKLER/SUPPRESSION DISABLING REQUEST FORM (ALMD & KD)

Date: _____

REQUESTING SERVICE/SECTION OR CONTRACTOR: _____

REQUESTOR'S NAME AND CONTACT NUMBER: _____

DATE OF CONSTRUCTION OR MAINTENANCE: _____

LOCATION OF CONSTRUCTION OR MAINTENANCE:

FLOORS/ROOMS: _____

ZONE (S): _____

FLOW SWITCH (ES): _____

WORK TO BE DONE: _____

START DATE & TIME OF WORK: _____

STOP DATE & TIME OF WORK: _____

NAME OF FOREMAN/PROJECT MANAGER AT WORK SITE: _____

CONTACT NUMBER OF FOREMAN/PROJECT MANAGER: _____

**FOREMAN/PROJECT MANAGER OR VA COR WILL NOTIFY THE ENERGY SYSTEMS
OPERATOR OR ELECTRONICS TECHNICIAN (ALMD), FIRE SYSTEMS TECH (KD), AT
START AND STOP OF CONSTRUCTION OR MAINTENANCE**

FOREMAN / PROJECT MANAGER INITIALS: _____

VA COR: _____

ELECTRONICS TECH (ALMD) / FIRE SYSTEM TECH (KD): _____

CC: M&O SUPERVISOR: _____

SAFETY: _____

VAPD: _____

REMARKS:

FIRE ZONE / NODE

LOCATION

RETURN FORM TO COR FOR DOCUMENTATION

HOT TAP WORK PERMIT - EQUIPMENT IN SERVICE (Page 1 OF 2)

Part I: TO BE COMPLETED BY THE REQUESTER:

Note: Separate request required for each individual hot tap.

Job/Work Order Number _____

(1) Description of piping/equipment/job location: _____

(2) Description of work to be done: _____

(3) Justification of why the piping/equipment cannot be de-energized through explanation of continuity of service is essential & shutdown impractical (Note: Inconvenience is not a factor): _____

Requester/Title _____

Date _____

Part II: TO BE COMPLETED BY THE QUALIFIED PERSONS *DOING* THE WORK:

(1) Have personnel executing the "Hot Tap" procedure provided documentation of the necessary level of training to met their responsibilities associated with the procedure: **YES / NO (circle)**

(2) **Competent Person** oversight is available and will be present during the hot tapping: **YES / NO (circle)**

(3) **Welding Required:** **YES / NO (circle)**

Hot Work permit was obtained and includes a specific Hot Tapping Welding Safety Task Review (API-2201, Appendix C): **YES / NO (circle)**

(4) Emergency Action Plan developed (i.e.API-2201, Appendix D): **YES / NO (circle)**

(5) Necessary personal protective equipment to safely perform the assigned task (FR Clothing, Welding Helmet, Gloves, etc...) _____

(6) Means employed to restrict the access of unqualified persons from the work area: _____

(7) Evidence of completion of a Job Briefing including discussion of any job-related hazards: _____

(8) Multi-Gas Meter is available, calibrated, and will be used for monitoring: **YES / NO (circle)**

(9) Do you agree the above described work can be done safely? **YES / NO (circle: If no return to requester)**

Contractor/ VA Operation Supervisor(s) _____

Date _____

COTR/VA Project Engineer _____

Date _____

Part III: RECOMMENDATION(S) TO PERFORM THE WORK WHILE EQUIPMENT IS IN SERVICE:

Chief of Engineering _____

Date _____

Facility Safety Officer _____

Date _____

Part IV: APPROVAL TO PERFORM THE WORK WHILE EQUIPMENT IS IN SERVICE:

Medical Center Director _____

Date _____

HOT TAP WORK PERMIT - EQUIPMENT IN SERVICE (Page 2 OF 2)

TO BE FILLED OUT BY THE REQUESTER

TYPE OF PROPOSED INSTALLATION

HEADER OR VESSEL INFORMATION

LINE SIZE (in.) _____ METALLURGY _____
OPERATING PRESSURE _____ PSIG TEMPERATURE _____ F°
PROCESS DESCRIPTION _____

BRANCH CONNECTION INFORMATION

LINE SIZE (in.) _____ FLANGE RATING _____ PSI
OPERATING PRESSURE _____ METALLURGY _____
INITIATOR _____ DATE _____

Provide location sketch of the proposed hot tap. The hot tap location must have scaffolding (where required for access), insulation must be removed and the equipment must be marked for the exact hot tap location prior to notifying Pressure Equipment Inspection.

TO BE FILLED OUT BY THE CONTRACTOR/VA PROJECT ENGINEER (COMPETENT PERSON) AND PRESSURE EQUIPMENT ENGINEER (QUALIFIED PERSON)

WALL THICKNESS @ HOT TAP LOCATION: _____ (in.) DETERMINED BY: _____ DATE: _____

WELD DETAIL NUMBER:

1. PROCEDURE: _____ X-RAY: _____
2. PROCEDURE: _____ X-RAY: _____
3. PROCEDURE: _____ X-RAY: _____

INSPECTOR: _____

TESTS REQUIRED:

(A) NOZZLE: _____ PSIG MEDIUM: _____

(B) REINFORCING PAD: _____ PSIG MEDIUM: _____

(C) BLOCK VALVE: HYDROSTATIC SEAT EACH SIDE @ _____ PSIG

AREA INSPECTOR: _____ DATE: _____

PRESSURE EQUIPMENT ENGINEER: _____ DATE: _____

TO BE FILLED OUT BY THE CONTRACTOR PERFORMING THE HOT TAP

HOT TAP MACHINE:

MAKE: _____ MACHINE RATING: _____ PSIG@: _____ F°
MODEL: _____ PRESSURE TESTED AT: _____ PSIG
SERIAL NO.: _____ BY: _____ DATE: _____
CONTRACTOR REPRESENTATIVE: _____ DATE: _____

**STVHCS
LOCKOUT/TAGOUT INSPECTION CHECKLIST
(29 CFR 1910.147 & NFPA 70E)**

Date of Inspection: _____

Project: _____

Machine or Equipment being installed/maintained/serviced: _____

COR: _____ Shop Supervisor / Contractor: _____ Facility Safety Representative: _____

Contractor's or VA Authorized Employee(s) performing servicing, repair, or maintenance:

		Yes	No	Pre-shutdown meeting Date/Initial Both Parties	Job Site Date/Initial Both Parties
1	Did the COR or Shop Supervisor and Safety Representative" review the VAMC's LOTO procedures with Contractor? [1910.147(f)(2)(i), 70E–Article 110.5]	_____	_____	_____	_____
2	Did the COTR or "Safety Officer" communicate information such as sources and magnitudes of hazardous energy to the equipment? [1910.147(f)(2)(i), 70E–Article 110.5]	_____	_____	_____	_____
3	If LOTO is infeasible and electrical work is being perform live, is a "Live Work Permit" being obtained that is signed by the VAMC Director? [70E–Article 130.1(B)(1) and VHA Directive 2006-056](If Yes, end use of this form and audit as "Live Work" procedure)	_____	_____	_____	_____
4	Does the contractor have documentation of LOTO training of its Authorized employees [1910.147(c)(7)(iv) and/or 70E-Article 110.6(E)]	_____	_____	_____	_____

General Requirements

		Yes	No	Pre-shutdown meeting Date/Initial Both Parties	Job Site Date/Initial Both Parties
5	Does the contractor have documentation of an audit of their LOTO procedures within the last year? [1910.147(c)(6)(i) and/or 70E-Article 120.2(C)(3)]	_____	_____	_____	_____
6	Does the contractor have a written general LOTO program/policy? [FAR 52.236-13 (f), 1910.147(c)(4)(i) and/or 70E-Article 120.2(C)(1)]	_____	_____	_____	_____
7	Was a hazard analysis performed for the work? [FAR 52.236-13 (f), 1910.132(d)(1),	_____	_____	_____	_____
8	Was appropriate PPE selected based upon the hazard analyses? [FAR 52.236-13 (f), 1910.132(d)(1)(i), 70E-Article 130.2(A) & 130.3	_____	_____	_____	_____
9	Was a written machine or equipment specific procedure developed for control of hazardous energy for those pieces with multiple sources of hazardous energy, including those with more than one source of the same energy type (i.e. two electrical energy sources)? [1910.147(c)(4)(ii) and/or 70E-Article 130.2(A) & 130.3	_____	_____	_____	_____
10	Are job briefings (i.e. review of procedure) given by the contractor prior to the start of work? [(1910.147(d)(1) or 70E, Article 110.7(G)]	_____	_____	_____	_____
11	Is LOTO only performed by the authorized employee(s)? [(1910.147(c)(7)(i)(A) or 70E, 70 E, Article 120.2(D)(2) & 120.2(D)(3)(d)]	_____	_____	_____	_____
12	Are affected employees notified prior to starting the work? [(1910.147(c)(9)]	_____	_____	_____	_____

General Requirements

		Yes	No	Pre-shutdown meeting Date/Initial Both Parties	Job Site Date/Initial Both Parties
13	Is the equipment being shut down using procedures established for the machine or equipment by the manufacturer? [(1910.147(d)(2)]	_____	_____	_____	_____
14	Are all sources of energy being de-energized utilizing energy isolating devices? (visual verification that all electrical disconnects are fully open if possible is required) [(1910.147(d)(3) or 70E, Article 120.1- (2 & 3)]	_____	_____	_____	_____
15	Are the appropriate locks, tags, and attachment devices being utilized? [(1910.147(c)(5)(ii) or 70E, Article 120.2(E)(2)]	_____	_____	_____	_____
16	Are only authorized employees using locks/tags on all energy isolating devices? [(1910.147(d)(4)(i) or 70E, Article 120.1-(4), 70 E, Article 120.2(D)(2) & 120.2(D)(3)(d)]	_____	_____	_____	_____
17	Is all stored energy being disconnected, restrained, and/or otherwise rendered safe? [(1910.147(d)(5) or 70E, Article 120.1-(6)]	_____	_____	_____	_____
18	Prior to starting work, is the equipment being verified as isolated by an authorized employee? (i.e. switch on the On/Off switch, test for zero energy, etc..) [(1910.147(d)(6) or 70E, Article 120.1-(5)]	_____	_____	_____	_____
19	If used, is the on/off switch returned to "off" position following try out?	_____	_____	_____	_____
20	Is the removal of the energy isolating device being accomplished by the authorized employee that applied the device? [(1910.147(e)(3)]	_____	_____	_____	_____

General Requirements

		Yes	No	Pre-shutdown meeting Date/Initial Both Parties	Job Site Date/Initial Both Parties
21	Is the work area and equipment inspected by an authorized employee to determine that the equipment is operationally intact and affected employees are clear before restart? [(1910.147(e) or 70E, Article 120.2(F)(2)(m))]	_____	_____	_____	_____
22	Are affected employees notified and clear of the work area prior to restarting of equipment? [(1910.147(e)(2)(ii) or 70E, Article 120.2(F)(2)(m))]	_____	_____	_____	_____
23	Has the contractor corrected all deficiencies? (FAR 52.236-13, VAAR 852.236-87, VHA Directive 2004-012)	_____	_____	_____	_____

Describe abatement actions taken (attach separate sheet as necessary):

We certify that any non-complaint conditions discovered during this inspection were reviewed with the General Contractor's Superintendent for this project. Any non-compliant conditions requesting immediate initiation of corrective action will receive a written notice from the Contracting Officer Representative via the Contracting Officer.

COR

Shop Supervisor / Contractor

Facility Safety Representative

[illegible]

ACTIVITY HAZARDS ANALYSIS

 Overall Risk Assessment Code (RAC)
 (Use highest code)

Date: _____ Project: _____

Activity: _____

Activity Location: _____

Prepared By: _____

Risk Assessment Code Matrix

 E = Extremely High Risk
 H = High Risk
 M = Moderate Risk
 L = Low Risk

E = Extremely High Risk H = High Risk M = Moderate Risk L = Low Risk		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

Add Identified Hazards

	JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
X				
X				
X				

Add Items

	EQUIPMENT	TRAINING	INSPECTION
X			
X			
X			

Involved Personnel: _____

Acceptance Authority (digital signature): _____

NWW Form 385-1 (Revised) April 2008

ACTIVITY HAZARDS ANALYSIS

 Overall Risk Assessment Code (RAC)
 (Use highest code)

Date prepared: _____

Project location: _____

Prepared by: _____

Job: _____

Reviewed by: _____

Risk Assessment Code Matrix

 E = Extremely High Risk
 H = High Risk
 M = Moderate Risk
 L = Low Risk

		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
Severity	Catastrophic	E	E	H	H	M
	Critical	E	H	H	M	L
	Marginal	H	M	M	L	L
	Negligible	M	L	L	L	L

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	RAC
			<div style="border: 1px solid black; width: 40px; height: 20px; text-align: center; line-height: 20px;">▼</div>
			<div style="border: 1px solid black; width: 40px; height: 20px; text-align: center; line-height: 20px;">▼</div>
			<div style="border: 1px solid black; width: 40px; height: 20px; text-align: center; line-height: 20px;">▼</div>
			<div style="border: 1px solid black; width: 40px; height: 20px; text-align: center; line-height: 20px;">▼</div>
			<div style="border: 1px solid black; width: 40px; height: 20px; text-align: center; line-height: 20px;">▼</div>
			<div style="border: 1px solid black; width: 40px; height: 20px; text-align: center; line-height: 20px;">▼</div>
EQUIPMENT	TRAINING	INSPECTION	

Approval Authority: _____

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Salvage of existing items to be reused or recycled.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 INFORMATIONAL SUBMITTALS

- A. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.

1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
 - 1. Comply with requirements specified in Section 013233 "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

- e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
- f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden

- space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 9. Dispose of demolished items and materials promptly.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Work in Historic Areas: Selective demolition may be performed only in areas of Project that are not designated as historic. In historic spaces, areas, and rooms, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Section 024296 "Historic Removal and Dismantling."
- D. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area **on-site**.
 5. Protect items from damage during transport and storage.
- E. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least **3/4 inch (19 mm)** at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

- B. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- C. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site **and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."**
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

**SECTION 04 05 16
GROUTING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Grout for filling hollow metal door frames.

1.2 RELATED REQUIREMENTS

A. Grout used in Section:

1. Section 08 11 13 HOLLOW METAL DOORS AND FRAMES

B. Section 09 91 00, PAINTING.

1.3 APPLICABLE PUBLICATIONS

A. Comply with references to extent specified in this section.

B. American National Standards Institute (ANSI):

1. A118.6-10 - Standard Cement Grouts for Tile Installation.

C. ASTM International (ASTM):

1. C40/C40M-11 - Organic Impurities in Fine Aggregates for Concrete.
2. C150/C150M-15 - Portland Cement.
3. C207-06(2011) - Hydrated Lime for Masonry Purposes.
4. C404-11 - Aggregates for Masonry Grout.
5. C476-11 - Grout for Masonry.
6. C595/C595M-15e1 - Blended Hydraulic Cement.
7. C979/C979M-10 - Pigments for Integrally Colored Concrete.
8. C1019-14 - Sampling and Testing Grout.

1.4 SUBMITTALS

A. Submittal Procedures: Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Manufacturer's Literature and Data:

1. Description of each product.

C. Test Reports: Certify each product complies with specifications.

1. Grout, each type.
2. Cement.
3. Aggregate.

D. Certificates: Certify each product complies with specifications.

1. Blended hydraulic cement.
2. Portland cement.
3. Grout.
4. Hydrated lime.

5. Aggregate.

1.5 DELIVERY

- A. Deliver products in manufacturer's original sealed packaging.
- B. Mark packaging, legibly. Indicate manufacturer's name or brand, type, production run number, and manufacture date.

1.6 STORAGE AND HANDLING

- A. Store masonry materials under waterproof covers on planking clear of ground, and protect damage from handling, dirt, stain, water and wind.
- B. Protect products from damage during handling and construction operations.

1.7 WARRANTY

- A. Construction Warranty: FAR clause 52.246-21, "Warranty of Construction."

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Grout Components:
 - 1. Hydrated Lime: ASTM C207, Type S.
 - 2. Aggregate For Masonry Grout: ASTM C404, Size 8.
 - 3. Blended Hydraulic Cement: ASTM C595, Type IS, IP.
 - 4. Portland Cement: ASTM C150, Type I.
 - 5. Water: Potable, free of substances that are detrimental to grout, masonry, and metal.

2.2 PRODUCTS - GENERAL

- A. Provide each product from one manufacturer

2.3 MIXES

- A. Grout: ASTM C476; fine grout and coarse grout.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine and verify substrate suitability for product installation.
- B. Protect existing construction and completed work from damage.
- C. Clean mortar from masonry cells protruding more than 13 mm (1/2 inch) to permit grout flow.
- D. Remove debris from grout spaces.
- E. Verify anchors are correctly placed before placing grout.

3.2 MIXING

- A. Mix grout in mechanically operated mixer.
 - 1. Mix grout for five minutes, minimum.
- B. Measure ingredients by volume using container of known capacity.
- C. Mix water with grout dry ingredients.
 - 1. Slump Range: 200 to 275 mm (8 to 11 inches).

3.3 GROUTING

- A. Use fine grout for filling hollow metal door frames.

- - E N D - -

**SECTION 07 92 00
JOINT SEALANTS**

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.2 SUBMITTALS:

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

1.6 PROJECT CONDITIONS:

- A. Environmental Limitations:
 - 1. Do not proceed with installation of joint sealants under following conditions:
 - a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C (40 degrees F).
 - b. When joint substrates are wet.
- B. Joint-Width Conditions:
 - 1. Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- C. Joint-Substrate Conditions:
 - 1. Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 DELIVERY, HANDLING, AND STORAGE:

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

1.8 DEFINITIONS:

- A. Definitions of terms in accordance with ASTM C717 and as specified.
- B. Backing Rod: A type of sealant backing.
- C. Bond Breakers: A type of sealant backing.

D. Filler: A sealant backing used behind a back-up rod.

1.9 WARRANTY:

A. Construction Warranty: Comply with FAR clause 52.246-21 "Warranty of Construction".

1.10 APPLICABLE PUBLICATIONS:

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

B. ASTM International (ASTM):

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

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

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

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

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

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

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

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

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

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

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

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

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

D412-06a(R2013).....Test Methods for Vulcanized Rubber and
Thermoplastic Elastomers-Tension

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

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

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

D. Environmental Protection Agency (EPA):

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

PART 2 - PRODUCTS

2.1 SEALANTS:

C. Interior Sealants:

1. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system are to comply with the following limits for VOC content when calculated according to 40 CFR 59, (EPA Method 24):
 - a. Architectural Sealants: 250 g/L.
 - b. Sealant Primers for Nonporous Substrates: 250 g/L.
 - c. Sealant Primers for Porous Substrates: 775 g/L.
2. Vertical and Horizontal Surfaces: ASTM C920, Type S or M, Grade NS, Class 25.
3. Food Service: Use a Vinyl Acetate Homopolymer, or other low VOC, non-toxic sealant approved for use in food preparation areas.
4. Provide location(s) of interior sealant as follows:
 - a. Typical narrow joint 6 mm, (1/4 inch) or less at walls and adjacent components.
 - b. Perimeter of doors, windows, access panels which adjoin concrete or masonry surfaces.
 - c. Interior surfaces of exterior wall penetrations.
 - d. Joints at masonry walls and columns, piers, concrete walls or exterior walls.
 - e. Perimeter of lead faced control windows and plaster or gypsum wallboard walls.
 - f. Exposed isolation joints at top of full height walls.
 - g. Joints between bathtubs and ceramic tile; joints between shower receptors and ceramic tile; joints formed where nonplanar tile surfaces meet.
 - h. Joints formed between tile floors and tile base cove; joints between tile and dissimilar materials; joints occurring where substrates change.

- i. Behind escutcheon plates at valve pipe penetrations and showerheads in showers.

2.2 COLOR:

- A. Sealants used with exposed masonry are to match color of mortar joints.
- B. Sealants used with unpainted concrete are to match color of adjacent concrete.
- C. Color of sealants for other locations to be light gray or aluminum, unless otherwise indicated in construction documents.

2.3 JOINT SEALANT BACKING:

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

2.5 FILLER:

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

2.6 PRIMER:

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

2.7 CLEANERS-NON POROUS SURFACES:

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

PART 3 - EXECUTION**3.1 INSPECTION:**

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

3.2 PREPARATIONS:

- A. Prepare joints in accordance with manufacturer's instructions and SWRI (The Professionals' Guide).
- B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.
 - 1. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.
 - 2. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include but are not limited to the following:
 - a. Concrete.
 - b. 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. Nonporous surfaces include but are not limited to the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.

- d. Glazed surfaces of ceramic tile.
- C. Do not cut or damage joint edges.
- D. Apply non-staining masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Apply primer to sides of joints wherever required by compound manufacturer's printed instructions or as indicated by pre-construction joint sealant substrate test.
 - 1. Apply primer prior to installation of back-up rod or bond breaker tape.
 - 2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.

3.3 BACKING INSTALLATION:

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

3.4 SEALANT DEPTHS AND GEOMETRY:

- A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.
- B. At widths over 6 mm (1/4 inch), sealant depth 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 degrees C and 38 degrees C (40 degrees and 100 degrees F).
2. Do not install polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.
 3. Do not install sealant type listed by manufacture as not suitable for use in locations specified.
 4. Apply caulking and sealing compound in accordance with manufacturer's printed instructions.
 5. Avoid dropping or smearing compound on adjacent surfaces.
 6. Fill joints solidly with compound and finish compound smooth.
 7. Tool exposed joints to form smooth and uniform beds, with slightly concave surface conforming to joint configuration per Figure 5A in ASTM C1193 unless shown or specified otherwise in construction documents. Remove masking tape immediately after tooling of sealant and before sealant face starts to "skin" over. Remove any excess sealant from adjacent surfaces of joint, leaving the working in a clean finished condition.
 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. Submit test reports.
 11. Replace sealant which is damaged during construction process.
- C. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise. Take all necessary steps to prevent three-sided adhesion of sealants.
- D. Interior Sealants: 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 cutouts to seal openings of electrical boxes, ducts, pipes and similar penetrations. To seal electrical boxes, seal sides and backs.
5. Control Joints: Before control joints are installed, apply sealant in back of control joint to reduce flanking path for sound through control joint.

3.7 CLEANING:

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

- - - E N D - - -

**SECTION 081113
HOLLOW METAL DOORS AND FRAMES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 04 Section "Unit Masonry" for embedding anchors for hollow metal work into masonry construction.
2. Division 08 Section "Fiberglass Reinforced Polyester (FRP) Doors".
3. Division 08 Section "Integrated Door Opening Assemblies".
4. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
5. Division 08 Section "Door Hardware".
6. Division 08 Section "Access Control Hardware".
7. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
 - 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 - 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 - 3. Smoke Control Door Assemblies: Comply with NFPA 105.
 - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by

blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. CECO Door Products (C).
 2. Curries Company (CU).
 3. Steelcraft (S).
 4. Approved Equal

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
 - 1. Design: Flush panel.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
 - 3. Level/Model: Level 3 and Physical Performance Level B (Heavy Duty), Minimum 16 gauge (0.042-inch - 1.0-mm) thick steel, Model 1.
 - 4. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
 - 5. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
 - 6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Manufacturers Basis of Design:
 - 1. CECO Door Products (C) Polystyrene Core - Legion Series.

2.4 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
 - 2. Manufacturers Basis of Design:
 - a. CECO Door Products (C) - SQ Series.

- C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Glazing: Comply with requirements in Division 08 Section "Glazing" and with the hollow metal door manufacturer's written instructions.
 - 1. Factory Glazing: Factory install glazing in doors as indicated. Doors with factory installed glass to include all of the required glazing material.
 - a. Glass type:
 - 1) Firelite NT or approved equal
 - b. Vision Lite Size:
 - 1) 06" x 33" Clear Vision

c. Vision Lite Location:

- 1) Maximum 43" A.F.F. to bottom of the glass.
- 2) Minimum 6" from the lead edge of the door.

2.7 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.8 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
- D. Hollow Metal Frames:
 1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
9. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.9 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
 1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
 - 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.

- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 081113

**SECTION 080671
DOOR HARDWARE SETS**

PART 1 - PRODUCTS

1.1 SCHEDULED DOOR HARDWARE

- A. Refer to "PART 3 - EXECUTION" for required specification sections.

PART 2 -

1. MK - McKinney
2. SU - Securitron
3. SA - Sargent
4. HS - HES
5. NO - Norton
6. RO - Rockwood
7. PE - Pemko
8. OT - By Others

Hardware Schedule

Set: 1.0

Doors: 111-1, 111-2, 111-3, 111-4, 111-5, 111-6, 111-7, 111-B, 112-2, 112-3, 112-4, 112-5, 112-6, 112-7, 112-B, 113-1, 113-2, 113-3, 113-4, 113-5, 113-6, 113-B, 115-1, 115-2, 115-3, 115-4, 115-5, 115-6, 115-B

Description: Single - Fire Rated - Exit Device-Passage

3 Heavyweight Hinge	A8111 (TA786 5" x 4-1/2")	US26D	MK	087100
1 Exit Device	Type 1; F-14 (12 8815 ETL)	US32D	SA	087100
1 Closer	C02011 / C02021 (351 O / P10)	EN	SA	087100
1 Kickplate	J102 (K1050 10" x 2" LDW 4BE CSK)	US32D	RO	087100
1 Door Stop	L02101 (406)	US32D	RO	087100
1 Adhesive Seal	R3E154 (S88D) length as required		PE	087100

Set: 2.0

Doors: 112-1

Description: Single - Fire Rated - Exit Device-Passage - Auto Operator

3 Heavyweight Hinge	A8111 (TA786 5" x 4-1/2")	US26D	MK	087100
1 Exit Device	Type 1; F-14 (12 8815 ETL)	US32D	SA	087100
1 Electric Strike	9500	630	HS	087100
1 SMART Pac Bridge Rectifier		2005M3	HS	087100
1 Automatic Operator	5930-RF1	689	NO	087100
1 Kickplate	J102 (K1050 10" x 2" LDW 4BE CSK)	US32D	RO	087100
1 Door Stop	L02101 (406)	US32D	RO	087100
1 Adhesive Seal	R3E154 (S88D) length as required		PE	087100
2 RF Actuator	533		NO	087100
1 Power Supply	BPS-24-1		SU	087100

Set: 3.0

Doors: 116-1, 116-2, 116-3, 116-4, 116-5, 116-6, 116-B

Description: Single - Fire Rated - Exit Device-Passage - Alarmed

3 Heavyweight Hinge	A8111 (TA786 5" x 4-1/2")	US26D	MK	087100
1 Exit Device	Type 1 F-14-ALM(AL 12 8815 ETL)	US32D	SA	087100
1 Closer	C02011 / C02021 (351 O / P10)	EN	SA	087100
1 Kickplate	J102 (K1050 10" x 2" LDW 4BE CSK)	US32D	RO	087100
1 Door Stop	L02101 (406)	US32D	RO	087100
1 Adhesive Seal	R3E154 (S88D) length as required		PE	087100

Set: 4.0

Doors: 113-7, 962-1, 962-2, 964-1, 964-2

Description: Single - Fire Rated - Exit Device-Passage - Electromagnetic Lock w/Card Reader

3 Heavyweight Hinge	A8111 (TA786 5" x 4-1/2")	US26D	MK	087100
1 Magnetic Lock	M680BD		SU	087100
1 Exit Device	Type 1; F-14 (12 8815 ETL)	US32D	SA	087100
1 Closer	C02011 / C02021 (351 O / P10)	EN	SA	087100
1 Kickplate	J102 (K1050 10" x 2" LDW 4BE CSK)	US32D	RO	087100
1 Door Stop	L02101 (406)	US32D	RO	087100
1 Adhesive Seal	R3E154 (S88D) length as required		PE	087100
1 Motion Sensor	XMS		SU	087100
1 Push Button	EEB2		SU	087100
1 Power Supply	BPS-24-1		SU	087100
1 Card Reader	By Security Contractor.		OT	

Set: 5.0

Doors: 11C-1, 11C-B, 96C-1, 96C-2

Description: Dbl Egress - Fire Rated - Wide - SVR Exit Device-Exit Only

6 Heavyweight Hinge	A8111 (TA786 4-1/2" x 4-1/2")	US26D	MK	087100
2 Exit Device	Type 3; F-01-LBR (12 NB8710)	US32D	SA	087100
2 Closer	C02011 / C02021 (351 O / P10)	EN	SA	087100
2 Kick Plate	J102 (K1050 10" x 1" LDW B4E CSK)	US32D	RO	087100
2 Door Stop	L02101 (406)	US32D	RO	087100
1 Adhesive Seal	R3E154 (S88D) length as required		PE	087100
2 Astragal	18041CNB		PE	087100

Set: 6.0

Doors: M5-1, M5-2, M5-3, M5-4, M5-5, M5-6, M5-B, M6-1, M6-2, M6-3, M6-4, M6-5, M6-6, M6-B

Description: Single - Outswing - Fire Rated - Storeroom Lock - Sound Seal

3 Hinge	A8112 NRP (TA714 NRP 4-1/2" x 4-1/2")	US26D	MK	087100
1 Storeroom Lock	F07 (8204 LNL LC)	US26D	SA	087100
1 Mortise Cylinder	Match the existing system	US32D	SA	087100
1 Closer	C02011 / C02021 (351 O / P10)	EN	SA	087100
1 Kickplate	J102 (K1050 10" x 2" LDW 4BE CSK)	US32D	RO	087100
1 Wall Stop	L02251 (409)	US32D	RO	087100
1 Threshold	J32300 (151A)		PE	087100
1 Adhesive Seal	R3E154 (S88D) length as required		PE	087100
1 Door Bottom	R0Y346 (411ARL)		PE	087100

Set: 7.0

Doors: M2-1, M2-2, M2-3, M2-4, M2-5, M2-6, M2-B, M3-3, M3-4, M3-5, M3-6

Description: Single - Outswing - Fire Rated - Storeroom Lock - Closer w/Stop Arm - Sound Seal

3 Hinge	A8112 NRP(TA714 NRP 4-1/2"x4-1/2")	US26D	MK	087100
1 Storeroom Lock	F07 (8204 LNL LC)	US26D	SA	087100
1 Mortise Cylinder	Match the existing system	US32D	SA	087100
1 Closer	C02021 PT-4G (351 CPS)	EN	SA	087100
1 Kickplate	J102 (K1050 10" x 2" LDW 4BE CSK)	US32D	RO	087100
1 Threshold	J32300 (151A)		PE	087100
1 Adhesive Seal	R3E154 (S88D) length as required		PE	087100
1 Door Bottom	R0Y346 (411ARL)		PE	087100

END OF SECTION 080671

SECTION 09 91 00
PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the painting and finishing as shown on the construction documents and/or specified herein, including, but not limited to, the following:
1. Prime coats which may be applied in shop under other sections.
 2. Prime painting unprimed surfaces to be painted under this Section.
 3. Painting items furnished with a prime coat of paint, including touching up of or repairing of abraded, damaged or rusted prime coats applied by others.
 4. Painting ferrous metal (except stainless steel) exposed to view.
 5. Painting galvanized ferrous metals exposed to view.
 6. Painting interior concrete block exposed to view.
 7. Painting gypsum drywall exposed to view.
 8. Painting includes shellacs, stains, varnishes, coatings specified, and striping or markers and identity markings.
 9. Incidental painting and touching up as required to produce proper finish for painted surfaces, including touching up of factory finished items.
 10. Painting of any surface not specifically mentioned to be painted herein or on construction documents, but for which painting is obviously necessary to complete the job, or work which comes within the intent of these specifications, is to be included as though specified.

1.2 RELATED WORK:

- A. Activity Hazard Analysis: Section 01 35 26, SAFETY REQUIREMENTS.
- D. Masonry Repairs: Section 04 05 13, MASONRY MORTARING.
- E. Shop prime painting of steel and ferrous metals: Division 08 - OPENINGS

1.3 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- C. Painter qualifications.
- D. Manufacturer's Literature and Data:
1. Before work is started, or sample panels are prepared, submit manufacturer's literature and technical data, the current Master

Painters Institute (MPI) "Approved Product List" indicating brand label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use subsequent MPI "Approved Product List", however, only one (1) list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.

G. Manufacturers' Certificates indicating compliance with specified requirements:

1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.

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. Specify Coat Types: Prime; body; finish; etc.

C. Maintain space for storage, and handling of painting materials and equipment in a ventilated, neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.

D. Store materials at site at least 24 hours before using, at a temperature between 7 and 30 degrees C (45 and 85 degrees F).

1.5 QUALITY ASSURANCE:

A. Qualification of Painters: Use only qualified journeyman painters for the mixing and application of paint on exposed surfaces. Submit evidence that key personnel have successfully performed surface preparation and application of coating on a minimum of three (3) similar projects within the past three (3) years.

- B. Paint Coordination: Provide finish coats which are compatible with the prime paints used. Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Upon request from other subcontractors, furnish information on the characteristics of the finish materials proposed to be used, to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify the Contracting Officer Representative (COR) in writing of any anticipated problems using the coating systems as specified with substrates primed by others.

1.7 REGULATORY REQUIREMENTS:

- A. Paint materials are to conform to the restrictions of the local Environmental and Toxic Control jurisdiction.
1. Volatile Organic Compounds (VOC) Emissions Requirements: Field-applied paints and coatings that are inside the waterproofing system to not exceed limits of authorities having jurisdiction.
 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.
 - c. Do not use coatings having a lead content over 0.06 percent by weight of non-volatile content.
 - d. For lead-paint removal, see Section 02 83 33.13, LEAD-BASED PAINT REMOVAL AND DISPOSAL.
 3. Asbestos: Provide materials that do not contain asbestos.
 4. Chromate, Cadmium, Mercury, and Silica: Provide materials that do not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.
 5. Human Carcinogens: Provide materials that do not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.
 6. Use high performance acrylic paints in place of alkyd paints.

1.8 SAFETY AND HEALTH

- A. Apply paint materials using safety methods and equipment in accordance with the following:

1. Comply with applicable Federal, State, and local laws and regulations, and with the ACCIDENT PREVENTION PLAN, including the Activity Hazard Analysis (AHA) as specified in Section 01 35 26, SAFETY REQUIREMENTS. The AHA is to include analyses of the potential impact of painting operations on painting personnel and on others involved in and adjacent to the work zone.
- B. Safety Methods Used During Paint Application: Comply with the requirements of SSPC PA Guide 10.
- C. Toxic Materials: To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:
 1. The applicable manufacturer's Material Safety Data Sheets (MSDS) or local regulation.
 2. 29 CFR 1910.1000.
 3. ACHIH-BKLT and ACGIH-DOC, threshold limit values.

1.9 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by basic designation only.
- B. American Conference of Governmental Industrial Hygienists (ACGIH):
 ACGIH TLV-BKLT-2012.....Threshold Limit Values (TLV) for Chemical Substances and Physical Agents and Biological Exposure Indices (BEIs)
 ACGIH TLV-DOC-2012.....Documentation of Threshold Limit Values and Biological Exposure Indices, (Seventh Edition)
- C. ASME International (ASME):
 A13.1-07(R2013).....Scheme for the Identification of Piping Systems
- D. Code of Federal Regulation (CFR):
 40 CFR 59.....Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coating
- E. Commercial Item Description (CID):
 A-A-1272A.....Plaster Gypsum (Spackling Compound)
- F. Federal Specifications (Fed Spec):
 TT-P-1411A.....Paint, Copolymer-Resin, Cementitious (For Waterproofing Concrete and Masonry Walls) (CEP)
- G. Master Painters Institute (MPI):
 4.....Interior/ Exterior Latex Block Filler
 45.....Interior Primer Sealer

- 47.....Interior Alkyd, Semi-Gloss, MPI Gloss Level 5
- 50.....Interior Latex Primer Sealer
- 51.....Interior Alkyd, Eggshell, MPI Gloss Level 3
- 53.....Interior Latex, Flat, MPI Gloss Level 1
- 79.....Marine Alkyd Metal Primer
- 138.....Interior High Performance Latex, MPI Gloss Level 2
- G. Society for Protective Coatings (SSPC):
 - SSPC SP 1-82(R2004).....Solvent Cleaning
 - SSPC SP 2-82(R2004).....Hand Tool Cleaning
 - SSPC SP 3-28(R2004).....Power Tool Cleaning
 - SSPC SP 10/NACE No.2....Near-White Blast Cleaning
 - SSPC PA Guide 10.....Guide to Safety and Health Requirements
- H. Maple Flooring Manufacturer's Association (MFMA):
- I. U.S. National Archives and Records Administration (NARA):
 - 29 CFR 1910.1000.....Air Contaminants
- J. Underwriter's Laboratory (UL)

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. Conform to the coating specifications and standards referenced in PART 3. Submit manufacturer's technical data sheets for specified coatings and solvents.

2.2 PAINT PROPERTIES:

- A. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.
- B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.
- C. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only to recommended limits.
- D. VOC Content: For field applications that are inside the weatherproofing system, paints and coating to comply with VOC content limits of authorities having jurisdiction and the following VOC content limits:
 - 1. Flat Paints and Coatings: 50 g/L.
 - 2. Non-flat Paints and Coatings: 150 g/L.
 - 3. Dry-Fog Coatings: 400 g/L.

4. Primers, Sealers, and Undercoaters: 200 g/L.
 5. Anticorrosive and Antirust Paints applied to Ferrous Metals: 250 g/L.
 6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
 7. Pretreatment Wash Primers: 420 g/L.
 8. Shellacs, Clear: 730 g/L.
 9. Shellacs, Pigmented: 550 g/L.
- E. VOC test method for paints and coatings is to be in accordance with 40 CFR 59 (EPA Method 24). Part 60, Appendix A with the exempt compounds' content determined by Method 303 (Determination of Exempt Compounds) in the South Coast Air Quality Management District's (SCAQMD) "Laboratory Methods of Analysis for Enforcement Samples" manual.

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 day's 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 COR and the product manufacturer. Under no circumstances are application conditions to exceed manufacturer recommendations.
 - c. When the relative humidity exceeds 85 percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions.
 2. Maintain interior temperatures until paint dries hard.
 3. Do no exterior painting when it is windy and dusty.
 4. Do not paint in direct sunlight or on surfaces that the sun will warm.
 5. Apply only on clean, dry and frost free surfaces except as follows:

- a. Apply water thinned acrylic and cementitious paints to damp (not wet) surfaces only when allowed by manufacturer's printed instructions.
 - b. Concrete and masonry when permitted by manufacturer's recommendations, dampen surfaces to which water thinned acrylic and cementitious paints are applied with a fine mist of water on hot dry days to prevent excessive suction and to cool surface.
6. Varnishing:
- a. Apply in clean areas and in still air.
 - b. Before varnishing vacuum and dust area.
 - c. Immediately before varnishing wipe down surfaces with a tack rag.

3.2 INSPECTION:

- A. Examine the areas and conditions where painting and finishing are to be applied and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.3 GENERAL WORKMANSHIP REQUIREMENTS:

- A. Application may be by brush or roller. Spray application only upon acceptance from the COR in writing.
- B. Furnish to the COR a painting schedule indicating when the respective coats of paint for the various areas and surfaces will be completed. This schedule is to be kept current as the job progresses.
- C. Protect work at all times. Protect all adjacent work and materials by suitable covering or other method during progress of work. Upon completion of the work, remove all paint and varnish spots from floors, glass and other surfaces. Remove from the premises all rubbish and accumulated materials of whatever nature not caused by others and leave work in a clean condition.
- D. Remove and protect hardware, accessories, device plates, lighting fixtures, and factory finished work, and similar items, or provide in place protection. Upon completion of each space, carefully replace all removed items by workmen skilled in the trades involved.
- E. When indicated to be painted, remove electrical panel box covers and doors before painting walls. Paint separately and re-install after all paint is dry.
- F. Materials are to be applied under adequate illumination, evenly spread and flowed on smoothly to avoid runs, sags, holidays, brush marks, air bubbles and excessive roller stipple.

- G. Apply materials with a coverage to hide substrate completely. When color, stain, dirt or undercoats show through final coat of paint, the surface is to be covered by additional coats until the paint film is of uniform finish, color, appearance and coverage, at no additional cost to the Government.
- H. All coats are to be dry to manufacturer's recommendations before applying succeeding coats.
- I. All suction spots or "hot spots" in plaster after the application of the first coat are to be touched up before applying the second coat.
- J. Do not apply paint behind frameless mirrors that use mastic for adhering to wall surface.

3.4 SURFACE PREPARATION:

A. General:

1. The Contractor shall be held wholly responsible for the finished appearance and satisfactory completion of painting work. Properly prepare all surfaces to receive paint, which includes cleaning, sanding, and touching-up of all prime coats applied under other Sections of the work. Broom clean all spaces before painting is started. All surfaces to be painted or finished are to be completely dry, clean and smooth.
2. See other sections of specifications for specified surface conditions and prime coat.
3. Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
4. Clean surfaces before applying paint or surface treatments with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used. Do not use solvents, acid, or steam on concrete and masonry. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.
5. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - a. Concrete: 12 percent.
 - b. Fiber-Cement Board: 12 percent.
 - c. Masonry (Clay and CMU's): 12 percent.
 - d. Wood: 15 percent.

e. Gypsum Board: 12 percent.

f. Plaster: 12 percent.

B. Wood:

1. Sand to a smooth even surface and then dust off.
2. Sand surfaces showing raised grain smooth between each coat.
3. Wipe surface with a tack rag prior to applying finish.
4. Surface painted with an opaque finish:
 - a. Coat knots, sap and pitch streaks with MPI 36 (Knot Sealer) before applying paint.
 - b. Apply two coats of MPI 36 (Knot Sealer) over large knots.
5. After application of prime or first coat of stain, fill cracks, nail and screw holes, depressions and similar defects with wood filler paste. Sand the surface to make smooth and finish flush with adjacent surface.
6. Before applying finish coat, reapply wood filler paste if required, and sand surface to remove surface blemishes. Finish flush with adjacent surfaces.
7. Fill open grained wood such as oak, walnut, ash and mahogany with MPI 91 (Wood Filler Paste), colored to match wood color.
 - a. Thin filler in accordance with manufacturer's instructions for application.
 - b. Remove excess filler, wipe as clean as possible, dry, and sand as specified.

C. Ferrous Metals:

1. Remove oil, grease, soil, drawing and cutting compounds, flux and other detrimental foreign matter in accordance with SSPC-SP 1 (Solvent Cleaning).
2. Remove loose mill scale, rust, and paint, by hand or power tool cleaning, as defined in SSPC-SP 2 (Hand Tool Cleaning) and SSPC-SP 3 (Power Tool Cleaning). // 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. Fill flat head countersunk screws used for permanent anchors.

- b. Do not fill screws of item intended for removal such as glazing beads.
- 4. Spot prime abraded and damaged areas in shop 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. Masonry, Concrete, Cement Board, Cement Plaster and Stucco:
 - 1. Clean and remove dust, dirt, oil, grease efflorescence, form release agents, laitance, and other deterrents to paint adhesion.
 - 2. Use emulsion type cleaning agents to remove oil, grease, paint and similar products. Use of solvents, acid, or steam is not permitted.
 - 3. Remove loose mortar in masonry work.
 - 4. Replace mortar and fill open joints, holes, cracks and depressions with new mortar specified in Section 04 05 13, MASONRY MORTARING. Do not fill weep holes. Finish to match adjacent surfaces.
 - 5. Neutralize Concrete floors to be painted by washing with a solution of 1.4 Kg (3 pounds) of zinc sulfate crystals to 3.8 L (1 gallon) of water, allow to dry three (3) days and brush thoroughly free of crystals.
 - 6. Repair broken and spalled concrete edges with concrete patching compound to match adjacent surfaces as specified in Division 03, CONCRETE Sections. Remove projections to level of adjacent surface by grinding or similar methods.
- 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 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.

3.5 PAINT PREPARATION:

- A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment and uniform composition.
- B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.

- C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.
- D. Mix two (2) component and two (2) part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.
- E. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

3.6 APPLICATION:

- A. Start of surface preparation or painting will be construed as acceptance of the surface as satisfactory for the application of materials.
- B. Unless otherwise specified, apply paint in three (3) coats; prime, body, and finish. When two (2) coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.
- C. Apply each coat evenly and cover substrate completely.
- D. Allow not less than 48 hours between application of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by COR.
- E. Apply by brush or roller. Spray application for new or existing occupied spaces only upon approval by acceptance from COR in writing.
 - 1. Apply painting materials specifically required by manufacturer to be applied by spraying.
 - 2. In new construction and in existing occupied spaces, where paint is applied by spray, mask or enclose with polyethylene, or similar air tight material with edges and seams continuously sealed including items specified in "Building and Structural Work Field Painting"; "Work not Painted"; motors, controls, telephone, and electrical equipment, fronts of sterilizes and other recessed equipment and similar prefinished items.
- F. 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.

3.7 PRIME PAINTING:

- A. After surface preparation, prime surfaces before application of body and finish coats, except as otherwise specified.
- B. Spot prime and apply body coat to damaged and abraded painted surfaces before applying succeeding coats.

- C. Additional field applied prime coats over shop or factory applied prime coats are not required except for exterior exposed steel apply an additional prime coat.
- D. Prime rabbets for stop and face glazing of wood, and for face glazing of steel.
- F. Metals (Hollow Metal Doors & Frames: (Manufacturers Standard Shop Primer)
 - 1. Steel and iron: MPI 79 (Marine Alkyd Metal Primer)
- G. Gypsum Board:
 - 1. Primer: MPI 50 (Interior Latex Primer Sealer) except use MPI 45 (Interior Primer Sealer) in shower and bathrooms.
- H. Gypsum Plaster and Veneer Plaster:
 - 1. MPI 45 (Interior Primer Sealer), except use MPI 50 (Interior Latex Primer Sealer) when an alkyd flat finish is specified.
- I. Concrete Masonry Units except glazed or integrally colored and decorative units:
 - 1. MPI 4 (Block Filler) on interior surfaces.

3.9 INTERIOR FINISHES:

- A. Apply following finish coats over prime coats in spaces or on surfaces specified in Section 09 06 00, SCHEDULE FOR FINISHES.
- B. Metal Work (Hollow Metal Doors & Frames):
 - 1. Apply to exposed surfaces.
 - 3. Hollow Metal Doors and Frames, Ferrous Metal, Galvanized Metal, and Other Metals Scheduled:
 - a. Apply two (2) coats of MPI 47 (Interior Alkyd, Semi-Gloss) unless specified otherwise.
- C. Gypsum Board:
 - 2. Two (2) coats of MPI 138 (Interior High Performance Latex, MPI Gloss Level to match existing).
- D. Plaster:
 - 1. Two (2) coats of MPI 51 (Interior Alkyd, Eggshell).
- E. Masonry and Concrete Walls:
 - 1. Over MPI 4 (Interior/Exterior Latex Block Filler) on CMU surfaces.
 - 2. Two (2) coats of MPI 53 (Interior Latex, Flat, MPI Gloss Level to match existing)

3.10 REFINISHING EXISTING PAINTED SURFACES:

- A. Clean, patch and repair existing surfaces as specified under "Surface Preparation". No "telegraphing" of lines, ridges, flakes, etc., through

new surfacing is permitted. Where this occurs, sand smooth and re-finish until surface meets with COR's approval.

- B. Remove and reinstall items as specified under "General Workmanship Requirements".
- C. Remove existing finishes or apply separation coats to prevent non compatible coatings from having contact.
- D. Patched or Replaced Areas in Surfaces and Components: Apply spot prime and body coats as specified for new work to repaired areas or replaced components.
- E. Except where scheduled for complete painting apply finish coat over plane surface to nearest break in plane, such as corner, reveal, or frame.
- G. Refinish areas as specified for new work to match adjoining work unless specified or scheduled otherwise.
- I. Sand or dull glossy surfaces prior to painting.
- J. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.

3.11 PAINT COLOR:

- A. Color and gloss of finish coats SHALL MATCH EXISTING unless otherwise noted.
- B. For additional requirements regarding color see Articles, "REFINISHING EXISTING PAINTED SURFACE"
- 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.

3.15 PROTECTION CLEAN UP, AND TOUCH-UP:

- A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.
- B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted of paint drops or smears.
- C. Before final inspection, touch-up or refinished in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

- - - E N D - - -

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies the furnishing, installation, connection, and testing of the electrical conductors and cables for use in electrical systems rated 600 V and below, indicated as cable(s), conductor(s), wire, or wiring in this section.

1.3 QUALITY ASSURANCE

- A. Refer to Paragraph, QUALIFICATIONS (PRODUCTS AND SERVICES), in Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1.4 FACTORY TESTS

- A. Conductors and cables shall be thoroughly tested at the factory per NEMA to ensure that there are no electrical defects. Factory tests shall be certified.

1.5 SUBMITTALS

- A. Submit six copies of the following in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

1. Shop Drawings:

- a. Submit sufficient information to demonstrate compliance with drawings and specifications.
- b. Submit the following data for approval:
 - 1) Electrical ratings and insulation type for each conductor and cable.
 - 2) Splicing materials and pulling lubricant.

2. Certifications: Two weeks prior to final inspection, submit the following.

- a. Certification by the manufacturer that the conductors and cables conform to the requirements of the drawings and specifications.
- b. Certification by the Contractor that the conductors and cables have been properly installed, adjusted, and tested.

1.6 APPLICABLE PUBLICATIONS

- A. Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are reference in the text by designation only.
- B. American Society of Testing Material (ASTM):

- D2301-10.....Standard Specification for Vinyl Chloride
Plastic Pressure-Sensitive Electrical
Insulating Tape
- D2304-10.....Test Method for Thermal Endurance of Rigid
Electrical Insulating Materials
- D3005-10.....Low-Temperature Resistant Vinyl Chloride
Plastic Pressure-Sensitive Electrical
Insulating Tape
- C. National Electrical Manufacturers Association (NEMA):
- WC 70-09.....Power Cables Rated 2000 Volts or Less for the
Distribution of Electrical Energy
- D. National Fire Protection Association (NFPA):
- 70-11.....National Electrical Code (NEC)
- E. Underwriters Laboratories, Inc. (UL):
- 44-10.....Thermoset-Insulated Wires and Cables
- 83-08.....Thermoplastic-Insulated Wires and Cables
- 467-07.....Grounding and Bonding Equipment
- 486A-486B-03.....Wire Connectors
- 486C-04.....Splicing Wire Connectors
- 486D-05.....Sealed Wire Connector Systems
- 486E-09.....Equipment Wiring Terminals for Use with
Aluminum and/or Copper Conductors
- 493-07.....Thermoplastic-Insulated Underground Feeder and
Branch Circuit Cables
- 514B-04.....Conduit, Tubing, and Cable Fittings

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Conductors and cables shall be in accordance with NEMA, UL, as specified herein, and as shown on the drawings.
- B. All conductors shall be copper.
- C. Single Conductor and Cable:
1. No. 12 AWG: Minimum size, except where smaller sizes are specified herein or shown on the drawings.
 2. No. 8 AWG and larger: Stranded.
 3. No. 10 AWG and smaller: Solid; except shall be stranded for final connection to motors, transformers, and vibrating equipment.

4. Insulation: THHN-THWN and XHHW-2. XHHW-2 shall be used for isolated power systems.

E. Color Code:

1. No. 10 AWG and smaller: Solid color insulation or solid color coating.
2. No. 8 AWG and larger: Color-coded using one of the following methods:
 - a. Solid color insulation or solid color coating.
 - b. Stripes, bands, or hash marks of color specified.
 - c. Color using 19 mm (0.75 inches) wide tape.
4. For modifications and additions to existing wiring systems, color coding shall conform to the existing wiring system.
5. Conductors shall be color-coded as follows:

208/120 V	Phase	480/277 V
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray *
* or white with colored (other than green) tracer.		

6. Lighting circuit "switch legs", and 3-way and 4-way switch "traveling wires," shall have color coding that is unique and distinct (e.g., pink and purple) from the color coding indicated above. The unique color codes shall be solid and in accordance with the NEC. Coordinate color coding in the field with the Resident Engineer.
7. Color code for isolated power system wiring shall be in accordance with the NEC.

2.2 SPLICES

- A. Splices shall be in accordance with NEC and UL.
- B. Above Ground Splices for No. 10 AWG and Smaller:
 1. Solderless, screw-on, reusable pressure cable type, with integral insulation, approved for copper and aluminum conductors.
 2. The integral insulator shall have a skirt to completely cover the stripped conductors.
 3. The number, size, and combination of conductors used with the connector, as listed on the manufacturer's packaging, shall be strictly followed.

C. Above Ground Splices for No. 8 AWG to No. 4/0 AWG:

1. Compression, hex screw, or bolt clamp-type of high conductivity and corrosion-resistant material, listed for use with copper and aluminum conductors.
2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
3. Splice and insulation shall be product of the same manufacturer.
4. All bolts, nuts, and washers used with splices shall be zinc-plated steel.

D. Above Ground Splices for 250 kcmil and Larger:

1. Long barrel "butt-splice" or "sleeve" type compression connectors, with minimum of two compression indents per wire, listed for use with copper and aluminum conductors.
2. Insulate with materials approved for the particular use, location, voltage, and temperature. Insulation level shall be not less than the insulation level of the conductors being joined.
3. Splice and insulation shall be product of the same manufacturer.

E. Plastic electrical insulating tape: Per ASTM D2304, flame-retardant, cold and weather resistant.

2.3 CONNECTORS AND TERMINATIONS

- A. Mechanical type of high conductivity and corrosion-resistant material, listed for use with copper and aluminum conductors.
- B. Long barrel compression type of high conductivity and corrosion-resistant material, with minimum of two compression indents per wire, listed for use with copper and aluminum conductors.
- C. All bolts, nuts, and washers used to connect connections and terminations to bus bars or other termination points shall be zinc-plated steel.

2.4 CONTROL WIRING

- A. Unless otherwise specified elsewhere in these specifications, control wiring shall be as specified herein, except that the minimum size shall be not less than No. 14 AWG.
- B. Control wiring shall be sized such that the voltage drop under in-rush conditions does not adversely affect operation of the controls.

2.5 WIRE LUBRICATING COMPOUND

- A. Lubricating compound shall be suitable for the wire insulation and conduit, and shall not harden or become adhesive.

- B. Shall not be used on conductors for isolated power systems.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install conductors in accordance with the NEC, as specified, and as shown on the drawings.
- B. Install all conductors in raceway systems.
- C. Splice conductors only in outlet boxes, junction boxes, pullboxes, manholes, or handholes.
- D. Conductors of different systems (e.g., 120 V and 277 V) shall not be installed in the same raceway.
- E. Install cable supports for all vertical feeders in accordance with the NEC. Provide split wedge type which firmly clamps each individual cable and tightens due to cable weight.
- F. In panelboards, cabinets, wireways, switches, enclosures, and equipment assemblies, neatly form, train, and tie the conductors with non-metallic ties.
- G. For connections to motors, transformers, and vibrating equipment, stranded conductors shall be used only from the last fixed point of connection to the motors, transformers, or vibrating equipment.
- H. Use expanding foam or non-hardening duct-seal to seal conduits entering a building, after installation of conductors.
- I. Conductor and Cable Pulling:
 - 1. Provide installation equipment that will prevent the cutting or abrasion of insulation during pulling. Use lubricants approved for the cable.
 - 2. Use nonmetallic pull ropes.
 - 3. Attach pull ropes by means of either woven basket grips or pulling eyes attached directly to the conductors.
 - 4. All conductors in a single conduit shall be pulled simultaneously.
 - 5. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- J. No more than three branch circuits shall be installed in any one conduit.
- K. When stripping stranded conductors, use a tool that does not damage the conductor or remove conductor strands.

3.2 INSTALLATION IN MANHOLES

- A. Train the cables around the manhole walls, but do not bend to a radius less than six times the overall cable diameter.

3.3 SPLICE AND TERMINATION INSTALLATION

- A. Splices and terminations shall be mechanically and electrically secure, and tightened to manufacturer's published torque values using a torque screwdriver or wrench.
- B. Where the Government determines that unsatisfactory splices or terminations have been installed, replace the splices or terminations at no additional cost to the Government.

3.4 CONDUCTOR IDENTIFICATION

- A. When using colored tape to identify phase, neutral, and ground conductors larger than No. 8 AWG, apply tape in half-overlapping turns for a minimum of 75 mm (3 inches) from terminal points, and in junction boxes, pullboxes, and manholes. Apply the last two laps of tape with no tension to prevent possible unwinding. Where cable markings are covered by tape, apply tags to cable, stating size and insulation type.

3.5 FEEDER CONDUCTOR IDENTIFICATION

- A. In each interior pullbox and each underground manhole and handhole, install brass tags on all feeder conductors to clearly designate their circuit identification and voltage. The tags shall be the embossed type, 40 mm (1-1/2 inches) in diameter and 40 mils thick. Attach tags with plastic ties.

3.6 EXISTING CONDUCTORS

- A. Unless specifically indicated on the plans, existing conductors shall not be reused.

3.7 CONTROL WIRING INSTALLATION

- A. Unless otherwise specified in other sections, install control wiring and connect to equipment to perform the required functions as specified or as shown on the drawings.
- B. Install a separate power supply circuit for each system, except where otherwise shown on the drawings.

3.8 CONTROL WIRING IDENTIFICATION

- A. Install a permanent wire marker on each wire at each termination.
- B. Identifying numbers and letters on the wire markers shall correspond to those on the wiring diagrams used for installing the systems.
- C. Wire markers shall retain their markings after cleaning.

- D. In each manhole and handhole, install embossed brass tags to identify the system served and function.

3.9 ACCEPTANCE CHECKS AND TESTS

- A. Perform in accordance with the manufacturer's recommendations. In addition, include the following:
 - 1. Visual Inspection and Tests: Inspect physical condition.
 - 2. Electrical tests:
 - a. After installation but before connection to utilization devices, such as fixtures, motors, or appliances, test conductors phase-to-phase and phase-to-ground resistance with an insulation resistance tester. Existing conductors to be reused shall also be tested.
 - b. Applied voltage shall be 500 V DC for 300 V rated cable, and 1000 V DC for 600 V rated cable. Apply test for one minute or until reading is constant for 15 seconds, whichever is longer. Minimum insulation resistance values shall not be less than 25 megohms for 300 V rated cable and 100 megohms for 600 V rated cable.
 - c. Perform phase rotation test on all three-phase circuits.

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